



Ontario

Royal Commission on Matters of
Health and Safety Arising from
the Use of Asbestos in Ontario

Submissions

v. 1

INDEX OF WRITTEN SUBMISSIONSBINDER VOLUME NUMBER: 1

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001	Mr. Victor Delmonte	Labour	I Health II Workplace	No	No
002	Mr. Mark S. Rudolph	Individual	II Workplace III Buildings IV Other	No	No
003	Borough of Scarborough, Building Department	Governments	III Buildings IV Institutional	No	No
004	Ms. Lorraine A. Cass, Public Health Nurse	Individual	IV Other	No	No
005	Mr. Howard Newcombe	Individual	I Health V Institutional	No	No
006	Mrs. Margaret Moir	Individual	I Health II Workplace	No	No
007	International Association of Bridge, Structural, and Ornamental Iron Workers, Local 721	Labour	I Health II Workplace III Buildings	Yes	Yes
008	Asbestos Information Association/North America (AIA/NA)	Industry	I Health II Workplace	Yes	Yes
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010	Ontario Medical Association, Committee on Public Health	Other Organizations	III Buildings	Yes, but in April.	No
011	American Industrial Hygiene Association, Ontario Local Section	Other Organizations	I Health II Workplace III Buildings IV Other V Institutional VI Measurement	Yes	No
012	Hamilton Labour Council, Hamilton Area Occupational Health & Safety Committee	Labour	II Workplace III Buildings	No	No
013	Labour Council of Metropolitan Toronto	Labour	II Workplace III Buildings V Institutional	No, but...	Yes
014	London and St. Thomas District Labour Councils, Health and Safety Committees	Labour	I Health II Workplace III Buildings	No, but...	Yes
015	Mrs. Frances Day	Labour	I Health II Workplace VII Workmen's Comp.	No	Yes: Asbestos Victims Ontario
016	Quebec Asbestos Mining Association	Industry	I Health II Workplace VI Measurement	Yes	Yes
017	Consumers' Association of Canada (Ontario)	Other Organizations	III Buildings IV Other V Institutional VI Measurement	No	No

4-1
September 9, 1980

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Dear Ms. Kahn,

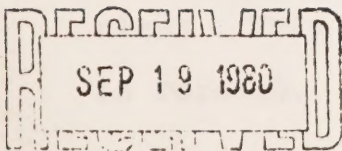
For the past several years I have been trying to obtain further information on the connection between asbestos and my lung condition. Two years ago I wrote the Koering Co. in Brantford requesting data. They did not respond. As far back as 1963 I wrote Johns-Manville. Their reply stated that nothing in the asbestos lining would have affected my lungs. However alot of questioning and research has been done since then.

The Martello Construction Company has been out of business for quite a few years so that area of approach is closed. The Union of Operating Enginecrs has been no help, because I did not continue to pay my dues after I realized that I could no longer run heavy machinery. The Workmen's Compensation Board was contacted quite a few years ago. They lost my file and after a great deal of prompting, they returned two years ago and conducted another set of interviews. I have recently been informed that they do not feel I qualify for compensation benefits.

Please send me a copy of your brochure and any other information you think would be relevant. I will not be able to attend the educative sessions as I require oxygen for many hours each day.

Please find enclosed a copy of my work and medical history. If you require any further information, please contact:

Victor Delmonte
51 Lakeside Drive
ST. CATHARINES, Ontario
L2M 1P3





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<https://archive.org/details/31761116535832>

WORK HISTORY OF VICTOR DELMONTE

Started work for Martello in 1954 and left approximately 9 months later. During this period I operated a "Bay City" backhoe in Regent Park loading trucks with broken down building materials and earth, also involved in numerous areas of Toronto loading trucks with demolished buildings in the city.

My reason for terminating employment with Martello was due to a former employee (Bert Nolan) returning to the company for his previous job which I now held. Mr. Nolan became ill after 18 months of working for Martello and was admitted to the hospital where he died a few weeks later. The cause of death as we heard was a peptic ulser, but had they looked into his lungs they would have found the real trouble. Bert Nolan worked under the same conditions as I did, but not as long. The real problem as I see it was the dusty conditions and the new asbestos linings for both friction and brakes. The new Koehring 605 & 405 used this type of asbestos lining. On all other types of machines that I have operated a woven lining was used, it was made of heavy type canvas with copper wires woven through the material. (At this point I believe it is very important to mention the chest xray (by the mobile unit from the Niagara Peninsula Sanitorium) I had taken just prior to becoming employed again by Martello in 1956 showed clear. This negative was checked by St. Michaels Hospital in Toronto.

I operated the new Koehring machine from 1956 to March 1960 when I was finally forced to leave my job due to the serious deterioration of my health. Recalling the condition of Bert Nolan that forced him into hospital, I was gravely concerned for my own health.

Having had a short leave, I took another job with Leo's Const. in Toronto. I operated a crane which was very easy work compared to the job I held with Martello, however I only lasted a few months and ended up in the hospital. Prior to going into the hospital Dr. Fader sent me to the clinic at Avenue Road and Lawrence and from there to the Gage Clinic. Unable to do anything for my condition they sent me to St. Michael's Hospital. The files from St. Michael's Hospital will explain what action was taken with regard to an operation. I remained in this hospital for a few months.

When I left the hospital I attempted to go back to full-time employment, however would end up back in the hospital after working for only a month or so. Since July of 1962 I have not been able to work.

J. Debnicki

ASBESTOS IN ONTARIO:

Recommendation to the Royal Commission
on Matters of Health and Safety
Arising from the Use of Asbestos in Ontario

Mark S. Rudolph
Graduate Student
Institute for Environmental Studies
Univeristy of Toronto

November 4, 1980

ASBESTOS IN ONTARIO:

Recommendation to the Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario

The following recommendations have been formulated for the consideration of the Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario regarding new occupational and environmental standards for asbestos, as well as more general stipulations concerning the use of asbestos in the Province of Ontario.

1. A new occupational standard of 0.1 fibres/cc (average over 8 hour exposure) greater than 5 μ , with a length to width ratio of 3 or greater should be established by January 1, 1982.
2. A new occupational standard of 0.5 fibres/cc (maximum over any 15 minutes) greater than 5 μ , with a length to width ratio of 3 or greater should be established by January 1, 1982.
3. A new environmental standard of 0.002 fibres/cc greater than 5 μ , with a length to width ratio of 3 or greater should be established by January 1, 1982.
4. The Occupational Health and Engineering Service of the Ministry of Labour and the Air Resources Branch of the Ministry of the Environment should take possession of a number of the most advanced automatic asbestos monitoring units (such as the British Magiscan unit) so that very precise measurements of samples taken from working conditions and the general environment may be taken to check for compliance with the newly recommended standards.
5. To assist the asbestos industry in achieving the above recommended occupational standards, economic incentives, (i.e., accelerated depreciation on newly installed asbestos hazard controlling capital equipment, low interest long-term loans or "environmental safety" subsidies, should be negotiated with members from industry, the Ministry of Labour and the Ministry of Industry and Tourism.

6. To alleviate economic disruptions which would be caused by the banning of asbestos, substitution of all "non-essential" uses of asbestos should be overseen by the Ministry of Consumer and and Corporate Affairs. Asbestos should preferably be replaced with non-fibrous substitutes, such as vermiculite and perlite, where possible.
7. Monitoring of the workplace should be conducted by a joint group, including employee/union members, company physicians, independent physicians and company management.
8. An asbestos compensation fund, to be administered by the Workmen's Compensation Board of Ontario, should be established by January 1, 1982. This fund will be made up of money from the following sources: 90% from a 1% tax on gross profits of all asbestos-related industries in the Province; the remaining 10%, computed annually and based on the above contribution from industry, contributed by the Province (in light of the fact that the Province will still allow and recognize some degree of health risk associated with the continued mining, milling, and production of asbestos products).
9. The Ministry of Health should maintain health records of all employees associated with all facets of asbestos production in the province from the date of implementation of these recommendations until an employee dies. Previous occupational records, asbestos conditions under previous standards (if attainable), asbestos conditions under the suggested new standards, and smoking habits should be documented. This procedure will serve as a monitoring mechanism for the suggested standards found in this memorandum.
10. All asbestos products should be adequately labelled with warnings advising of the danger to health.
11. The importation of any product containing crocidolite into the Province of Ontario should be banned.

With reference to recommendation #1, the rationale and criteria for this proposal may be substantiated as follows. First, it must be understood at the outset that in determining the effects on human health of a contaminant, such as asbestos, there are two forms of dose-response relationships. In the first, it may be assumed that

there is some non-zero dose rate, below which the risk of a hazard to health is zero. Thus, this relationship involves the concepts of a threshold value. In the second dose-response relationship, it is assumed that there is a risk corresponding to any dose, no matter how small or insignificant. (1)

The research conducted for the preparation of this paper indicates that asbestos produces the second type of dose-response relationship. Therefore, the only safe level of asbestos in the workplace and in the environment is zero. Realizing this point, and understanding the economic implications of banning the production and use of asbestos completely, I have determined that it is necessary to decide on some level of effect which is "acceptable".

"This is a very difficult problem since it inevitably involves balancing the risks to health against the benefits of the material, and against the consequences of demanding excessive dust reduction." (2)

The approach which I recommend is one which the Royal Commission members may call "risk limited". (3) In other words, the government should pursue regulations which limit the overall health risk posed by asbestos without forcing a complete ban on the material.

The present occupational standard in Ontario, (i.e., 2 fibres/cc) was designed to prevent asbestosis, not cancer. (4) This standard, originally recommended by the British Occupational Hygiene Society

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1. G. Berry, "Hygiene standards--- theory and application," WHO Monographs: Asbestos IARC, Vol. 14, 1977, p. 145.
 2. Ibid., p. 146.
 3. Ibid.

in 1966, is based on data from pre-1966 studies, fitted to a log-normal dose-response curve. This data led to the prediction that there is a 1% lifelong risk of developing asbestosis (i.e., a cumulative dose of 2 fibres/cc for 50 years, therefore a cumulative dose of 100 fibres year/cc). (5) However, more recent data and other assumptions have determined that 50 years exposure at 2 fibres/cc could lead to risks of asbestosis an order of magnitude greater than 1%. (6)

Furthermore, I believe that the "risk limited" approach should apply not only to the risk of acquiring asbestosis, but also to other asbestos related diseases, such as pleural calcification, lung cancer, cancer of other organs, and both pleural and peritoneal mesothelioma.

These facts have been influential in determining that the new occupational standard should be one-twentieth of the present standard, i.e., 0.1 fibres/cc. The standards found in recommendations 2 and 3 are also one-twentieth the value of the present standards. This one-twentieth multiplier has not been chosen arbitrarily. The National Institute for Occupational Safety and Health (NOISH) in the United States recently recommended a 0.1 fibre/cc limit in U.S. asbestos plants. (7) Furthermore, from a technological point of view, Rahjans et. al., from the Ontario Ministry of Labour have stated:

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4. L. Tataryn, "Dust to Death: A Detective Story," presented to the Science and the Environment Conference, Strong College, York Univeristy, Toronto, November 1977, p. 3.
 5. J. Peto, "Hygiene Standard for Chrysotile Asbestos," The Lancet, March 4, 1978, p. 484.
 6. Ibid.
 7. Sandra Martland, "Resisting Multinational Asbestos: The struggle for Workplace Safety in Newfoundland," Alternatives, Vol. 7, No. 4, p. 52.

"We have no doubt that fibre levels of 0.1 fibres per millilitre (= 0.1 fibres/cc) can be achieved...collection efficiency would only be obtained by totally enclosed processing, all wet processing, or some similar technology." (8)

It is evident, based on my review of the literature, expert testimony provided in a series of lectures in an undergraduate Environmental Studies course at the University of Toronto, and the recognized need to reduce the risk of all diseases associated with asbestos in the workplace, that technological process changes are required for all industrial operations associated with asbestos in the Province of Ontario. Furthermore, I realized that such changes will require a large capital expenditure program by the asbestos industry in order to comply with the recommended standards. To alleviate the financial burden placed on the industry, recommendation 5 has been put forward for the Royal Commission's consideration. Economic incentives, in the form of accelerated depreciation on capital equipment, low interest long-term loans, and/or "environmental safety" subsidies (or a combination of these), will be necessary to keep the industry viable, competitive on the world market, and to insure that they have the ability to comply with the new standards. The use of the previously mentioned economic incentives is not new in Ontario with respect to pollution abatement; precedence has been set for the use of similar mechanisms in the province's pulp and paper industry. To date, these measures have worked quite efficiently.

8. G.S. Rahjans, et.al., "Asbestos Exposures in Ontario: A Review," Ontario Ministry of Labour, Vol. 29, No. 2, p. 6.

Recommendation 3 allows for an environmental standard of 0.002 fibres/cc.* This value represents 5% of the present acceptable environmental standard in Ontario. Initially it may be difficult to achieve, especially in urban areas, in light of evidence collected by the Air Resources Branch of the Ontario Ministry of the Environment. (9)

This standard was chosen on the basis of the risk-limited approach that I consider mandatory. In the general environment (i.e., not the workplace), the risk of acquiring any asbestos-related disease should be minimized. The evidence that I have reviewed indicates that persons who have never been associated with asbestos in the workplace have died from mesothelioma. (10) The environmental standard recommended in this submission is attainable provided that occupational and emission standards in asbestos-related industries are complied with, and "non-essential" asbestos products are replaced by other non-fibrous materials. However, the monitoring of this recommended level may be difficult with present monitoring conditions.

In order that recommendations 1 through 3 are complied with, the workplace and the environment must be strictly monitored both by the Ministry of Labour and the Ministry of the Environment.

*	0.1 fibres/cc	x	$\frac{40 \text{ hour work week}}{168 \text{ hour week}}$	x	$\frac{1}{10}$	= 0.00238 = approx. 0.002
	↑		↑		↑	↑
	recommended occupational standard		worker exposure		safety factor	recommended environmental standard

9. Asbestos as a Hazardous Contaminant: Progress Report II, Air Resources Branch, Ontario Ministry of the Environment, Toronto, February 1976, pp. 1-7.
10. "Asbestos: Background Notes for a Public Seminar", IES, U of T, 1977.

It may be expected that critics of these recommendations will point out the fact that the standard deviation of measurement can be as large as the actual standards recommended herein. With monitoring equipment during the 1970's, this indeed might have been the case with the low standards recommended in this submission. However, the Vickers' Magiscan unit, which became commercially available at the end of 1979 (11), and other devices which should be forthcoming to compete with the Vickers' unit, hold much promise in being able to precisely measure fibre/cc levels. It is recommended that the Ministry of Labour and the Ministry of the Environment investigate these new units, purchase an optimal number to handle the future monitoring needs, and provide information and demonstrations of these devices to asbestos industry workers and management as well as to interested members of the public. This action is absolutely necessary to impress upon critics that the government is capable of monitoring and enforcing the recommendations for the new standards. There is no need for the government to be accused of passing regulations which cannot be enforced.

Recommendation 6 refers to the substitution of all "non-essential" uses of asbestos. The benefits gained by society from the use of asbestos have been great; however, evidence implicating asbestos with asbestosis, mesothelioma, and other diseases has spurred research and development to find substitutes for asbestos. I advocate further research for, and development of, such substitutes, and the replacement of asbestos products with these substitutes so that health risks are minimized, in concurrence with the risk-limited approach taken in this paper. However, although it has been stated that;

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11. "Automatic Detection and Counting of Asbestos Fibres," American Industrial Hygiene Association Journal, (40), July 1979, pp. A50-A53.

"... the medical and scientific evidence suggests that almost without exception the substitutes are safer than asbestos," (12)

glass fibres have been found to cause mesothelioma (also caused by asbestos) in experimental research with animals. (13) Further medical studies are required to investigate the possible health hazards associated with asbestos substitutes. Most recent evidence indicates that fibrous structures, similar in nature to those found in asbestos, may be responsible for the health hazards associated with asbestos. (14) Therefore, it is recommended that non-fibrous substitutes, such as Vermiculite and Perlite, should be preferred for incorporation in "asbestos-substitute" products in the Province of Ontario.

Recommendation 7 is self-explanatory, and is designed solely to provide a system of checks and balances between management and workers in the monitoring of the work environment under the newly proposed occupational standards. A sense of mutual co-operation is required in this matter; the asbestos worker now realizes the health hazards of working with asbestos and will not tolerate misinformation; nor should profits override concern for the worker's health.

In light of the fact that various asbestos-related diseases will occur in the next twenty to forty years regardless of what new standards are set in the near future (since there is a latency period between

12. Asbestos: Killer Dust, BSSRS, 1979, p. 104.

13. Ibid., p. 105.

14. Ibid., p. 109.

exposure and onset of disease), recommendation 8 suggests the establishment of an asbestos compensation fund. This fund is to be administered by the Workmens' Compensation Board. Money in the fund will be derived from both the asbestos industry and the Provincial Government. It is recommended that the industry should contribute 1% of their gross annual profits to the fund. This amount of money contributed to the fund annually by the industry would represent 90% of the total. The remaining 10% would be contributed by the Provincial Government from the general revenue fund. The money from the fund would be used to compensate the families of asbestos workers who died from asbestos-related diseases. It will be essential to monitor the total inputs and outputs of the fund to determine if the industry should contribute a larger or smaller percentage of their gross annual profits.

Recommendation 9 is designed to monitor the adequacy and efficiency of the newly recommended standards as well as to provide essential information into the understanding of the health hazards associated with asbestos. This recommendation suggests that information be acquired concerning the following: previous occupational records, asbestos conditions under previous working conditions, asbestos conditions under newly recommended standards, and smoking habits. The concern regarding smoking habits stem from evidence that cigarette smoking has synergistic effects on the incidence of asbestos-induced cancers.

"Selikoff found that an asbestos worker who smokes cigarettes has eight times the risk of lung cancer as other smokers, and 92 times the risk of non-smokers not exposed to asbestos." (15)

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15. Lawrence McGinty, "The Risk Equations: A Ban on Asbestos?", New Scientist, July 14, 1977, p. 96.

Information acquired through this Ministry of Health monitoring program will help to increase our knowledge of this synergistic effect.

The final two recommendations are self-explanatory, and again adhere to the risk-limited approach. The labelling of asbestos products advising of the danger to health, and recommending how the product may be used with minimal exposure to asbestos fibrils is of primary importance in the consumer market. Banning of the importation of products containing crocidolite is designed to further minimize asbestos-related health hazards, as crocidolite has been implicated, albeit with questionable scientific rigour, as having more pronounced health risks at much lower exposure levels than other forms of asbestos. It is believed that as there are few products presently being imported which contain crocidolite. Therefore this measure will have a minor impact from an economic viewpoint, while it works towards reducing health hazards.

CONCLUSION

I believe that the recommendations contained in this submission are sound measures which the Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario should recommend for adoption by the Cabinet of the Province of Ontario. The benefits to society in general, and to asbestos workers in particular, far outweigh the costs incurred by the adoption of these recommendations.

I have carefully studied and evaluated relevant information. In fact, asbestos fits the same criteria by which polychlorinated biphenyls (PCBs) were banned. But benefits to society from the use of asbestos have influenced me in deciding not to ban asbestos. Accordingly I am advocating a risk-limiting approach, an approach which relies on the adoption, implementation, and enforcement of the recommendations found in this submission.

Borough of Scarborough

150 Borough Drive

Scarborough, Ont. M1P 4N7

Refer to **Paul Meleta** Telephone (416) 438-xxxx 296-7317

November 14, 1980

Royal Commission on
Matters of Health and Safety Arising from the
Use of Asbestos in Ontario
Queens Park
Toronto, Ontario
M7A 9Z9

Dear Sirs:

In regard to Institutional and Policy Issues, I wish to present the following information which may be helpful in your review of the use of asbestos in Ontario.

A glancing look through the Building Code is not sufficient to determine the permissible uses of asbestos. The Building Code makes reference to other regulatory standards which call up manufacturer's installation instructions which in turn call for the use of asbestos.

For example, the Building Code requires all factory-built fireplaces to conform to ULC.S610-1974. This standard calls up NFPA211 which requires the installation to comply with laboratory listing and the manufacturer's installation instructions. One particular manufacturer accepts combustible walls located within the minimum clearance distances to be protected by 1" thick asbestos board. Many listed fireplace stove manufacturers call for their product to be placed upon a 3/8" thick asbestos base placed upon combustible floors.

This type of back referencing applies to other products which involve referenced standards which lead to manufacturer's requirements, e.g. some fire doors call for asbestos paper sheeting, wired glass windows in screens are bedded in asbestos strips, and some wood roof shingles are underlaid with asbestos paper.

It is vital to sort through the many referenced documents in order to determine the extent of the use of asbestos.

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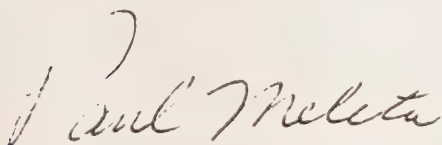
R.C. - Use of Asbestos in Ont. (Cont'd.)

November 14, 1980

In consideration of wall, and floor shields and screen windows, an obvious situation exists which can provide a degree of safety. Where exposure of asbestos is restricted by some sort of encapsulation, particle air borne matter and harmful health effects (if any) to occupants are unlikely. The exposure of asbestos to installers and construction workers working around exposed asbestos does present another matter for review.

Enclosed please find our Department's present viewpoint regarding asbestos in buildings.

Yours truly,

A handwritten signature in cursive script that reads "Paul Meleta". The signature is written in dark ink and is positioned above the typed name and title.

Paul Meleta,
Building Inspector
Borough of Scarborough

PM;ds

Encl.

J. W. L. 10/10/10
1. Wade

Health Facts

April 15, 1981

ASBESTOS HAZARDS IN SCHOOL BUILDINGS

Recently throughout Canada the news media has been featuring "scare" stories about schools and public buildings where asbestos mixtures were sprayed on ceilings or steel beams during construction for fire protection purposes. It is generally implied that through deterioration or physical damage to these sprayed compounds on the ceilings school children are being exposed to dangerous levels of asbestos fibre dust.

Because asbestos has been identified under certain circumstances to be a carcinogen (a cancer-causing agent), parents in particular, and the public in general, have become very agitated and are demanding immediate action. School boards are being faced with demands that the school be closed, rebuilt or, at the very least, the offending asbestos compounds be removed.

In many cases the potential hazards in removing the asbestos insulation materials are far greater than leaving them in place. If the ceiling materials were applied properly, do not show signs of wear or flaking, and are not subjected to malicious or accidental damage, then no renovation action need be undertaken. If the coating is friable but in good repair, and not readily accessible, encapsulation with an appropriate coating material should be considered. Major expenditures for removal should only be considered if the coating is friable, in poor repair or readily accessible to damage.

To fully appreciate how ridiculous this whole situation is and to be able to get the facts straight should any of your friends wish to discuss it with you, you should be aware of the following points:

- (a) Asbestos is a basic part of the earth's crust. It is found throughout the world. It occurs naturally in the air we breathe, the water we drink and the food we eat. We have been living with it since the beginning of time.
- (b) Of course they can find asbestos in classrooms when they analyse the dust samples taken from the air. In most cases the asbestos levels are very similar to, or identical to, levels found outdoors or in other buildings where asbestos was not used in their construction. All too frequently comparison measurements are not taken and it is simply established that asbestos was found in the air in the school.

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Asbestos hazards in school buildings/continued

QUITE
TRUE
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- (c) As far as medical researchers have been able to determine no one in the general public has ever been shown to have died from asbestos induced disease. Not one single case! Only people who are occupationally involved either directly or indirectly with asbestos fibre seem to develop asbestos related disease. And, in most cases, the exposures took place years ago before the need for careful dust control was fully appreciated. The Advisory Committee on Asbestos Cancers of the International Agency for Research on Cancer stated after a comprehensive seminar in Lyons, France in 1972, that there is no evidence that asbestos poses any risk to the general public. This committee is a division at the World Health Organization and is composed of representatives from many nations.

The problem with the general view held by the news media and the public in regard to asbestos stems from statements made by some medical authorities that carcinogens have no safe level of exposure. Or that many thousands of cancers in years to come will be attributable to asbestos exposure.

As stated by Paul Kotin, M.D., Johns-Manville's Senior Vice President Health, Safety and Environment in his written statement to the U.S. House of Representatives Committee on Education and Labour on January 9, 1979.

"Because of my considerable knowledge and experience with regard to health hazards associated with asbestos, I am convinced that although, based on current knowledge, asbestos-containing spray materials in school buildings represent an inappropriate use of asbestos, no evidence exists to indicate that the presence of these materials poses a health hazard."

Under ordinary circumstances, the presence of asbestos in ceiling materials is a situation no different from that which exists by virtue of asbestos comprising a significant part of the earth's crust. Scientific literature establishes that background concentrations of asbestos are unrelated to any increase in disease."

Removal of asbestos now or in the future on these buildings will pose a hazard unless done under control
T.J.

Ms. Lorraine A. Cass
46 Lowther Avenue
Toronto, Ontario
M5R 1C6

November 16, 1980

Royal Commission on Asbestos
180 Dundas St. W., 22nd Floor
Toronto, Ontario
M5G 1Z8

Exposure of the public to asbestos via the use of hairdryers is of particular concern to me. Many of our homes contain several of these innocuous appearing instruments, which I fear, may eventually prove to be anything but harmless.

Public interest and media attention prompted me to phone the Ministry of Consumer and Corporate Affairs a few years ago. At that time I was assured there was no asbestos hazard from hair dryers. However, American consumer magazines have carried articles on this subject in the past year, indicating the contrary. For example, General Electric (US) will retrofit all (previously sold) units possible with a non-asbestos insulator, and a long list is given of units containing asbestos. The expense to G.E. must be enormous, and would indicate that a risk does indeed exist, contrary to the assurance I had previously received.

I would like to recommend the following to the Commission:

- (1) That a scientific study be undertaken regarding this particular hazard, or documentation of previous inquiry, if adequate.
- (2) That Canadian manufacturers be encouraged to replace or refit hazard products previously sold to consumers.
- (3) That a large public education campaign take place, to enter every home (for example leaflets with telephone bills.)

This particular hazard exposes a very large percentage of the population and for this reason deserves special attention.

I would be most pleased to receive any further information from the Commission on this subject, and would be happy to be of assistance in future, if indicated, as preventive medicine is my field, and special interest.

Yours sincerely,

Lorraine A. Cass
Public Health Nurse
B.A. (Sociology)

H. B. NEWCOMBE
P.O. BOX 135
DEEP RIVER, ONT.
K0J 1P0

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1980 November 25

Royal Commission on Matters of Health and Safety
Arising from the Use of Asbestos in Ontario
180 Dundas Street West, 22nd Floor
TORONTO, Ontario M5G 1Z8

Dear Sirs,

Submission on
HEALTH EFFECTS OF ASBESTOS, and
INSTITUTIONAL AND POLICY ISSUES

Please regard this Submission as relating to the POLICIES which will be needed if we are to detect the HEALTH EFFECTS of asbestos with the degree of sensitivity which should be possible in the future.

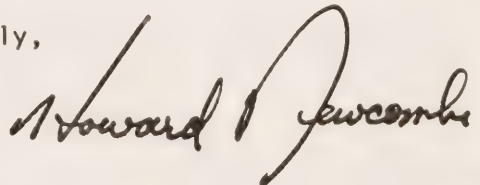
As long as epidemiological follow-up of those at risk remains an untidy and expensive afterthought, and is not appropriately planned in advance, we will be unlikely ever to detect the effects of any but high-level exposures.

Work records and exposure records, as currently provided for under Ontario's Bill 70 and its Regulations, were not designed for efficient and inexpensive epidemiological follow-up. If these are allowed to accumulate as separate annual records and to formats that are not standardized, it could cost millions to convert them later into cumulative personal histories for the purpose of searching out death records and cancer registrations with which to assess possible associations. Moreover, the personal identifiers required under the Regulations are barely adequate for the searching so that accuracy will be poor.

Appropriate procedures for this sort of thing have been developed to a high degree of sophistication at Statistics Canada (in the Vital Statistics and Disease Registries Section, following on work at Chalk River). Canada is unique in the world in this respect. But the limiting factor is almost always the primitive nature of the work-history records.

If the Commission wants to explore the technical detail, there is ample documentation of the relevant Canadian developments, and I would be happy to help in any way.

Sincerely,



143 Lawson Road
Highland Creek

December 1/80

J. Stefan Dupré
The Royal Commission on Asbestos

Sirs:

I take liberty to express my personal views, and hope someone will listen, on what asbestos is doing to the people in my family, in view of the concern our neighborhood has, today, on the hazards in the schools and surrounding environment, adjacent, in particular to the Johns-Manville Plant on Lawrence Avenue in the Highland Creek, Port Union area.

I say, that with intentional, industrial, neglect, and ignorance on the part of our community dwellers, twenty-five years ago our children were submitted to untold dangers. Today, it is these people, we feel have been unjustifiably neglected, also, having been subjected to these materials that were installed in our schools and homes, and with no concern for alarm on the part of an environment committee.

I, as a mother and wife of a man who worked at the Johns-Manville Plant for twenty-five years, now feel utterly trapped, to imagine how these asbestos materials will affect the health of my children, let alone my husband or even myself.

Looking back now, I think of the many times I washed the work clothes of my husband, sometimes even by hand, and of how our car would often become coated with a fine gummy dust, after having been parked at the Plant all day.

I can also remember the days when we would notice a decided odour in the air, covering the whole area from Lawson Road down to Lawrence Avenue when the wind was not in our favour, the odour was a sick, rancid smell and I presumed it came from the same Plant; Johns-Manville.

There were special occasions years ago, when Johns-Manville would hold Open House to all members of workers families, and the neighborhood as well. A conducted tour of the Plant was given, refreshments were served in the grounds and even souvenirs were distributed, such as ashtrays made from an asbestos material, to be taken home.

Today I commute by GO-train each day to work in Toronto. I board the train at the Rouge Hill Station, not far from the Johns-Manville Plant. When passing, I see unbelievable piles of broken and some pulverized asbestos pipes, strewn along the ditches by the railway tracks, a place accessible from the waterfront and the Highland Creek Park.

As my closing comment, which seems ironic to me, regards my elderly Mother who visited Great Britain this summer and while there was hospitalized for a few weeks because of a lung problem (fibrosis). Upon examination by a group of doctors, she was asked if she had ever lived near an asbestos plant.

When she said "yes, for about twenty years and about 1 1/2 miles away," she was asked if it was possible for her to live elsewhere, as they felt that the atmosphere was affecting her breathing.

I realize that some twenty-five years ago, people were kept ignorant of the hazards of this material, asbestos, here in Canada, particularly our men. Could you please explain to me and my family why Great Britain has banned asbestos entering their country for more than fifty years?

Now, let us firstly be concerned about these people who twenty-five years ago lived in ignorance, breathed this silent killer dust, through no fault of their own and worked under deplorable conditions.

Sincerely,

Mrs. Margaret Moir

7

WRITTEN SUBMISSION BY:

Phone
534-8489-8480

**INTERNATIONAL ASSOCIATION OF
BRIDGE, STRUCTURAL AND ORNAMENTAL IRON WORKERS**

Rodmen
Welders

Local Union 721 - Affiliated with the A.F.L.-C.I.O.

Riggers
Machinery Movers

1604 Bloor St. West, TORONTO, ONTARIO M6P 1A7

January 8, 1981

To: THE ROYAL COMMISSION ON MATTERS OF HEALTH AND SAFETY ARISING FROM THE USE OF ASBESTOS IN ONTARIO.

We, the International Association of Bridge, Structural and Ornamental Iron Workers, Local 721, of Toronto, respectfully submit the following brief.

During the period of 1959 to 1973, approximately, it was a common construction practise to fireproof structural steel with asbestos. Although that practise has fortunately become a thing of the past, we mention it to draw your attention to the long-term exposures of the tradesmen who applied the asbestos and the others who worked around it, many of whom are Iron Workers.

We recognize asbestos as a killer not only for the effects of lung fibrosis that occur after exposure but also because of the indisputable link between asbestos exposure (often at low levels) and cancer. Therefore our position is that all currently manufactured, or used, asbestos-bearing products should be banned from the market. This includes asbestos tile and pipe, drywall and caulking compounds. Substitute with products that are asbestos free and remove the exposure of trademen and others to such a hazardous material.

However, this only deals with half the problem. Structures built before 1973 often have asbestos bearing material in place and during demolition, renovation and removal workers are very often exposed.

We hope to assist the Commission by relating our experiences in the renovation aspect of this problem and ask you consider the recommendations we will bring forward at the end of this brief to apply to all areas; renovation, removal and demolition.

In the past we have had many members exposed to asbestos while renovating, expanding or strengthening structures in plants, schools, shopping plazas and the like. The duration of these jobs was typically between two weeks and two months.

In 1977 an extensive renovation program was begun at Terminal #1 of the Toronto International Airport. The circular shaped building which then contained both observation and passenger holding rooms in its outer area was to have its ceilings strengthened to hold additional air conditioning to service the observation areas that were due to be changed to extra passenger holding rooms. This entailed the removal of the false ceiling and the addition of extra structural members. In order for this to be done, Iron Workers were required

to scrape asbestos fire-proofing from the existing steel beams. A subsequent Ministry of Labour analysis reported the fire-proofing as being chrysotile asbestos, the free silica content being less than 1%.

The duration of the above mentioned job was two years, and we estimate workers were exposed for approximately eighteen months. Although during this time Iron Workers were the only ones to scrape the beams, just about all other trades were on the site and exposed as only one room was renovated at a time.

At no time after the job began were the workers warned of the asbestos hazard. The Iron Workers' Union Steward, becoming suspicious of the nature of the fire-proofing material, called the Ministry of Labour Construction Health and Safety Branch. An Inspector arrived and removed samples the next day. It took five weeks before the results of the analysis were known and then only after the politicians and newspapers had been informed of this scandalous delay. Respirators were then issued upon the insistence of the Iron Workers' Union and the sub-contractor let it be known that this was at extra cost to him. Personnel from the Ministry of Labour then arrived to conduct general and personal air samples to determine the exposures. General samples showed a fibre level of 2,600,00 m-3 (2.6 fibres per cc) and personal samples were as high as 4,500,000 m-3 (4.5 fibres per cc). These samples had been taken in an area where the windows had been removed even though most of the time the Iron Workers worked in an enclosed and confined space. The protests that the Iron Workers made at that time on this point went unheeded.

The Ministry directed the constructor to:

- ↓
- (1) "Thoroughly soak the asbestos with water before removal." (Iron Workers were supplied with a small windex bottle with which to spray).
 - (2) "Segregate the asbestos removal operations so adjacent areas are not contaminated with dust." (this was never done).
 - (3) "Provide and make the wearing of approved respirators mandatory. This applies to all workers in the area." (Only the Iron Worker and Sheet Metal Workers were supplied with respirators upon their own insistence).

- (4) "Loose asbestos will not be allowed to accumulate on the floor. It shall be cleaned up using vacuum or wet mopping and disposed of in a sealed container. Dry sweeping of asbestos will not be permitted." (Most of the time dry sweeping was used to clean up loose asbestos. Occasionally the man sweeping used a coffee cup to spread water before sweeping it up. All the asbestos was disposed of in the regular garbage).
- (5) "Eating, drinking and smoking will not be permitted in contaminated areas." (No separate facilities were ever made available).

These directions were never posted on the jobsite or otherwise brought to the attention of the workers. The General and Sub-contractors never informed the men of the hazard of asbestos. The Iron Workers' Union invited the Construction Safety Association of Ontario to hold a meeting with the men. Very little encouragement was given by the contractor or its representatives to the men to attend. The Iron Workers' Union requested a mobile unit to conduct medical examinations of the men. When it arrived, other trades lined up to be examined. These other tradesmen were told that since the Iron Workers had requested the examinations only they could have them. The Sheet Metal Workers insisted on being examined and out of approximately sixty workers, some twenty were examined. The consistent attitude of the contractors was that if we don't pay any attention the the asbestos it will go away. On this, as on other jobs of shorter duration, where we have again raised the issue on behalf of the workers on the job, we hear the incessant cry that coveralls and respirators have not been covered in the contractors bid for the job. We hope that you have found this account useful in your deliberations. We respectfully submit the following recommendations to the Royal Commission concerning the demolition, renovation and removal of asbestos and asbestos bearing materials.

RECOMMENDATIONS

- 1) That the owner and/or constructor, as defined in the Occupational Health and Safety Act, be responsible to identify the presence of any dangerous material, in particular asbestos. This will permit sub-contractors to bid the cost of effective jobsite controls into his price. The assistance of the Ministry of Labour and/or Environment should be given to owners and constructors to identify hazardous materials.
- 2) the task of asbestos decontamination of the work areas should be performed before all other tasks on jobsite. The work area must be completely sealed off from the outside and the asbestos should be thoroughly soaked in water. The crew involved in the removal must wear positive pressure masks or hoods. All asbestos removed must be sealed in suitable containers while still wet. Proper dump sites should be identified by the Ministry of the Environment. In regard to the exposure controls employed: We feel that an essential consideration is the practicality of any control mechanisms. With the heavy physical demands of most construction work, unlike much in-plant work, simple respirators become ineffective. Hard work demands deep breaths and respirators will restrict the tradesmen's ability to take quick deep breaths. Furthermore, the discomfort of perspiration running around the edges of such masks will tend to cause the tradesman to be loathe to the wearing of the masks.
- 3) All employers should provide full body protection. It is essential to prevent the transference of asbestos from the site to the public transit, private car or home. Therefore dual changing rooms should be provided. These would be essentially of an "airlock" type where employees could discard their daily clothing, pass through a shower area and don their protective clothing. After shift, the employees may then leave the contaminated clothing, pass through the shower area and clothe themselves back into their regular uncontaminated clothing.
- 4) When hazardous materials have been identified on a jobsite, the Minister of Labour should appoint an Occupational and
cont'd.....

- 4) Health and Safety Committee with their discretion under Section 8 (3) of the Occupational Health and Safety Act. While it would be obviously impracticable on small jobs of only a few workers, it would be irresponsible to suggest that the Minister should not appoint a committee when jobs as large as the International Airport Terminal #1 described above reoccur again and again. This Local Union respectfully suggests that the Commission recommend to the Minister to use his/her power when more than ten workers are to work with any hazardous material, and in particular asbestos.
- 5) That the Provincial Government press the Federal authorities to start a national registry of all workers who have been exposed to asbestos, including length and extent of exposures, medical records, lung function or other tests and the worker or his representative must be permitted access to such records upon request.



Ontario

Ministry of LABOUR

1122111

I.S.B. File No. :

O.H.P.B. File No. : 8B-55

OCCUPATIONAL HEALTH PROTECTION BRANCH

FIELD VISIT REPORT

416/965-4066

Date: March 15, 1977

From: D.A. Brown, P. Eng.

Toronto International Airport

Terminal 1

Malton, Ontario

Mr. M. Demeter -
Architect

Asbestos

Requested by: O.S.B.

Accompanied by: Mr. M. Polny - O.H.B.
Mr. D. Southwick - O.S.B.

Date of Visit:
February 22, 1977

Copies to:
Dr. V.L. Tidey (1)
Mr. K. Cleverdon (3)
Mr. J.C. Radford, Project
Manager - Eastern Construction
Mr. S. Morton (1)
Mr. B. Male, Assistant Manager,
Venture Metal (1)

This visit was made to assess asbestos exposure of the welding crew while insulation is removed from beams. A significant exposure was found to exist not only to the men removing insulation but to any other worker in the enclosure.

It is also felt that other tradesman who must work near these beams could also receive an asbestos exposure. A return visit should be made to investigate this.

Five directions are suggested.

One recommendation is also made.

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OCCUPATIONAL SAFETY BRANCH	
MAR 22 1977	
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- 2 -

Terminal 1 is a circular shaped building with the outer area containing observation and holding room. At the moment there are six observation rooms and they are to be converted to holding rooms. This expansion requires that extra air conditioning be installed. In order to accomplish this the present false ceiling in the observation rooms must be taken down and reinforced beams added to support the roof and brackets welded to the joists to support the new ductwork. The purpose of this visit was to assess the exposure of men who remove insulation from existing beams to weld new beams and brackets in place. The original insulation which was applied 10 - 15 years ago has been analyzed (see laboratory report #16,738 dated March 2, 1977) and found to contain serpentine asbestos. The new insulation which is used for batch up work was identified as Spray Don Mineral Fiber and consists mainly of glass fibers (see above mentioned laboratory report).

COMMENTS

1. There are 3 crews each consisting of a welder and a helper who are responsible for removing insulation from beams and welding new brackets and beams. While this operation is taking place there are usually no other tradesman in the room. Once the welding is completely finished plumbers, electricians, ladders etc. would be involved in finishing off the room.
2. During the visit I observed men removing insulation from a joist and made the following observations. Two men working from a scaffold, used a small bottle with a spray pump to apply a mist of water to the insulation being removed. The purpose of this was to suppress the formation of dust that results during removal. Although the small amount of water no doubt wet the surface in order to adequately suppress dust formation, the insulation must be thoroughly soaked. The men then hammered and scrapped away at the insulation for about 5 - 10 minutes until a hole about two ft. square had been established. During that time although the majority of insulation removed was coarse there was an excessive amount of fine dust produced. Some of this debris was gathering on the scaffold but the majority was falling on the floor. It is essential that this material not be allowed to accumulate over the shift but be cleaned up immediately by vacuuming or wet mopping. Dry sweeping should never be allowed since very high dust exposures can result.
3. Although the width and height of the observation rooms are constant at 30' and 12' the length varies from 78' to 130'. On the average there are 2 - 3 large beams and about 2 dozen angle supports per room which must be installed. Although the men may strip insulation and weld as little as one or two hours per day they spend their entire shift in the room. The remaining time is usually spent hoisting, positioning and moving steel around to prepare to do the welding.
4. The contractor is only allowed to close one holding room at a time so as not to inconvenience air travellers. At the moment there is enough welding to employ the three crews for about two more months. After that period only one or two crews will be employed

for the next 1½ years to finish the project. During that period the welders will not work continuously but will come and go as required. It was stressed by the company that it is not possible at this time to state what the work schedule would be for the welders after the next two months. Possibly a return visit should be made at that time to look at the welding activity but also to assess exposure of (through air sampling) the other workers who also work in these rooms.

For example there are men who must cover the water pipes with fiberglass insulation. They must work in and around beams and they could easily dislodge insulation and receive significant asbestos exposures. The ladders who tear down the false ceilings are obviously subjected to extremely high dust exposures created by the dust which accumulates in the plenum. Since the majority of this dust originates from insulation flaking off beams it is essential that these ladders be protected by approved respirators and coveralls with highly fitting cuffs and gloves to prevent skin contact with the insulation which can cause rashes.

5. Air samples for asbestos were taken during the visit (see A.Q.A. report #387). The first two samples taken on Don Brown and Richard Doiron indicate the exposure received while these two men stripped insulation from a joist and welded a bracket to it. Although the removal of insulation took only 5 - 10 minutes the welding was not complete until about another 30 minutes. The results of 4.1 and 4.5 fibers > 5 micrometers in length/cc are likely to represent the highest exposure these men will receive. If the insulation was thoroughly soaked prior to removal the exposure could be reduced by a significant amount.

Samples #3 (John Donaldson) and #4 (E. Boucher) were personal samples taken while these men were moving beams and other materials in the room while Brown and Doiron were welding. Although the results of 2.5 and 2.7 fibres/cc are less than results obtained by men in direct contact with the insulation it is apparent that anyone in the room will be exposed to a significant extent.

Sample #5 is an area sample taken in the room during the stripping operation. As to be expected this result is compatible with samples #3 and #4.

Sample #6 was placed on Randy Poulin who is not with the welding crew but rather is involved in tearing down the false ceilings and installing wires to support the new ductwork. During the first part of the half hour sample he was on a break and for the last part he was bending and shaping existing hanging wire. This man was working around insulated beams located outside holding room L. This sample of 2.1 fibres/cc is an indication of the exposure to be expected while working around these beams while only occasionally making contact with them.

By overaging samples #4, #5, #6 we can reasonably assume that in areas where insulation has been removed the airborne concentration will be just slightly greater than the Threshold Limit Value set at 2 fibres greater than 5 micrometers in length per cc of air. This is a time-weighted concentration for a 7 or 8 hour workday and 40 hour week and it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect.

Since the present welding crew will be working at least two more months and a smaller crew for a better part of 1½ years than the air samples taken during the visit should be compared with the present Ontario standard set at 2 fibres/cc.

In order to protect the welding crew from the asbestos exposure all workers in the exposed area must wear approved respirators. This includes not only the men removing insulation and welding but any other men who are in the room. During the visit the men were wearing respirators identified as Wilson 1400 which is approved for asbestos.

6. Some of the men wondered how long respirators could be worn before they lose their effectiveness. As stated during the visit, it is not possible to put on a time limit on this, rather it must be stressed that with any filtering device the efficiency actually increases as it is used since the collected dust fibre builds up a cake which does as much filtering as the original filter media. However, as the filter cake builds up it becomes harder to draw air through it. Thus when the worker finds it difficult to breathe through the respirator this is the time to replace it. A worker should not be alarmed if the front face piece builds up with dust as this is merely a indication of material filtered out of the air he breathes.
7. It is important that each operator be provided with more than one respirator and that it be kept in a clean place such as an office or locker. If they are left lying around the job site dust will gather on the inside and this will give the worker a high dust exposure when he uses it. In the same manner respirators which are being used during the day should also be kept in a clean place at the end of the shift.

RECOMMENDATION

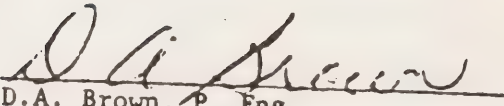
1. A return engineering visit along with air sampling should be carried out to accurately assess the asbestos exposure of other tradesman who are involved in this construction project.

DIRECTIONS

1. Thoroughly wet or soak the asbestos insulation with water or wet steam before removing. At the moment only a fine spray of water is applied. NEVER DONE PROPERLY
2. Segregate the asbestos removal operations so adjacent areas are not contaminated with asbestos dust. NEVER DONE

3. Provide and make the wearing of approved respirator mandatory. This applies not only to the men removing insulation but any other worker in that area. *ONLY TWO TRADES SUPPLIED WITH PROPER RESPIRATORS WELDERS COULD NOT WEAR THEM.*
4. Loose asbestos insulation shall not be allowed to accumulate on the floor. It shall be cleaned up using vacuum or wet mopping, and disposed of in a sealed container. Dry sweeping of asbestos waste shall not be allowed. *DID NOT COMPLY - DISPOSED OF IN REGULAR GARBAGE*
5. Eating, drinking, and smoking shall not be allowed in the contaminated work area. This means that smoke breaks and lunches shall be taken in rooms or areas not contaminated with asbestos dust. *NEVER COMPLIED WITH*

DAB:ds
Attachment


D.A. Brown, P. Eng.

BEFORE THE
ROYAL COMMISSION ON MATTERS
OF HEALTH AND SAFETY
ARISING FROM THE USE OF ASBESTOS
IN ONTARIO

Phase I Hearings,
February 19, 1981

STATEMENT OF HARRISON B. RHODES, DR. ENG. SC.,
ON BEHALF OF THE
ASBESTOS INFORMATION ASSOCIATION/NORTH AMERICA

Good Morning Commissioners, Mr. Laskin, Ladies and Gentlemen. My name is Harrison B. Rhodes. I am a Technology Manager with Union Carbide Corporation, and I am appearing today on behalf of the Asbestos Information Association/North America. I am a member of the Executive Committee of AIA/NA, and Chairman of its Air Monitoring Committee. As requested in the Royal Commission's guidelines for these Phase I hearings, my statement will be a brief one, intended to summarize AIA/NA's written submission dated January 6, 1981.

AIA/NA is a non-profit organization representing about 50 companies in the United States and Canada that are engaged in the mining, processing, manufacturing and marketing of asbestos and asbestos-containing products. Although our offices are located in the United States, our members include several Canadian corporations. In addition, most of the asbestos used by our members is mined in Canada, and many of

our members also manufacture and market asbestos-containing materials in Canada.

AIA/NA is committed to the safe production and use of asbestos, and supports appropriate government regulation to protect the health of persons working with this uniquely versatile and valuable mineral. To that end, we have participated actively in numerous regulatory proceedings concerning asbestos, both in the U.S. and in Canada.

In summary of our written submission, I would like to make two major points in my statement today. The first point concerns the process that the Royal Commission should follow in establishing health goals or standards for asbestos exposure. The second involves the need to adopt reasonable and cost-effective methods of achieving those goals, and to avoid unrealistic or unnecessary procedures.

I.

With regard to the first point, AIA/NA strongly urges the Royal Commission to establish asbestos-related health goals in a careful and measured fashion, and, in particular, to avoid the pitfalls of attempting to set goals which seek to create a society totally free from all risk.

The number of potential health, safety and other hazards we face in the modern world is very large, and any effort to provide "absolute safety" from each of these hazards will quickly run up against the limits of society's ability to

respond. Warren Burger, the Chief Justice of the United States Supreme Court, made this point succinctly in his opinion in the Court's recent decision to strike down a U.S. occupational regulation for benzene, which, like asbestos, has been shown to cause cancer, but only at exposure levels well above those set by the current standard. The benzene regulation had been predicated on the "zero risk" philosophy I just described, and Chief Justice Burger had this to say:

When the administrative record reveals only scant or minimal risk of material health impairment, responsible administration calls for avoidance of extravagant, comprehensive regulation. Perfect safety is a chimera; regulation must not strangle human activity in the search for the impossible.

In short, we believe that the Royal Commission's objective should be the identification of situations where asbestos exposure poses a significant risk, as the U.S. Supreme Court held in the Benzene Case. All of the available evidence should be examined in a detached, scientific manner, in order to reach sound conclusions about what types and levels of asbestos exposure present significant health hazards. In conducting such an inquiry, the Commission should avoid the temptation to base its conclusions on limited data, and should recognize that similar inquiries are currently underway in

other arenas, including several different U.S. agencies, the United Kingdom, and Europe.

A full and objective scientific analysis, coupled with consideration of the efforts of other governmental bodies, will help ensure that your conclusions reflect a consensus in the international scientific community. AIA/NA is prepared to assist you in any way we can. We are confident that such a process will disclose that there is no substantial evidence of a significant health risk to workers in occupational environments complying with a 2 fibers/cc standard -- the standard that currently prevails just about everywhere in the industrialized Western World.

II.

At this point I would like to move on to the second part of my statement, concerning the need to adopt reasonable, cost-effective methods of eliminating significant risk situations. As you know, there is a broad range of control methods available to reduce significant risks, ranging all the way from self-help programs aided by labels and warnings, to the drastic step of a total ban. In our view, your task is to develop a program which is both (i) fine-tuned -- in the sense that it recognizes that different exposure situations may call for different regulatory responses, and (ii) cost effective -- that is, avoids unnecessary or needlessly expensive control procedures.

Those points are perhaps best explained by way of example from our experience in the U.S. As you may know, occupational health standards in the United States typically contain requirements such as engineering controls, exposure monitoring, medical surveillance, and related recordkeeping. These requirements are designed for use in manufacturing industries involving fixed worksites, predictable or controlled environments, and relatively steady employment patterns. These kinds of requirements can prove to be very burdensome and counterproductive, however, when imposed on construction and other operations involving non-fixed worksites, high turnover rates, and constantly changing exposure conditions.

Because about three-quarters of all U.S. asbestos-related production is consumed in the construction industry, AIA/NA developed an alternative regulatory approach for these operations, relying primarily on work practices as the most effective means of providing work environments free from significant risk due to asbestos exposure. In brief, our proposal calls for the classification of asbestos-containing products into three categories: (A) products which will not release more than 2 fibers/cc under any reasonably foreseeable circumstances; (B) products which will not release more than 2 fibers/cc when certified work practices are used; and (C) products not falling into either of the first two categories. Our proposal calls for no regulation of Category A Products, requirements that

certified work practices be used when working with Category B products, and normal regulation of Category C products. Our approach not only guarantees worker protection through requirements that are easily monitored and enforced, but also creates strong incentives for manufacturers to develop safer products and work practices.

Since February 1980, when we first made the proposal available to various U.S. agencies, the concept of using certified work practices in lieu of monitoring and other traditional industrial hygiene requirements has been endorsed by the Occupational Safety and Health Administration's Advisory Committee on Construction Safety and Health, and, just last month, by a special two-agency construction industry task force made up of representatives of the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health. Because of these developments, we are very hopeful that future revisions to the U.S. asbestos standard will include the cost-effective regulatory approach of relying on certified workpractices in place of other requirements which are of little value in construction and similar worksites. A copy of our Proposal, as well as several booklets which describe the types of workpractices on which employers and employees can rely to minimize asbestos exposure, are appended to our written submission.

I hope that this example helps to demonstrate that if we are careful enough, we can develop reasonable regulatory requirements and avoid needless frustration and expense. AIA/NA is committed to achieve this objective for all situations where asbestos exposure poses a significant risk.

* * * * *

That concludes my statement. Before taking your questions, I would like to express on behalf of AIA/NA my appreciation for the opportunity to appear before you today, and my hope that we can be of some assistance in this and future hearings. I would be happy to attempt to respond to any questions concerning AIA/NA's written submission, including the appendices. Thank you.



ASBESTOS INFORMATION ASSOCIATION

1745 Jefferson Davis Highway, Crystal Square 4, Suite 509
Arlington, Virginia 22202 • (703) 979-1150

January 6, 1981

J. Stephen Dupre, Chairman
Royal Commission on Matters of Health
and Safety Arising from Use of
Asbestos in Ontario
180 Dundas Street West
22nd Floor
Toronto, Ontario M5G 1Z8

JAN 14 1981

Dear Dr. Dupre:

The Asbestos Information Association/North America (AIA/NA) welcomes the opportunity to participate in the Royal Commission's investigation of the use of asbestos and asbestos-containing products in the province of Ontario. We submit with this letter a number of documents that should be useful to the Commission in its deliberations and a copy of our letter to your legal counsel, John I. Laskin, requesting formal standing to participate in Phases II and IV of the Commission's hearings. We also request that AIA/NA be allowed to make an oral presentation to the Commission as part of its Phase I hearings.

AIA/NA is a non-profit organization representing about 50 companies who mine, manufacture, and market asbestos and asbestos-containing products in the United States and Canada. Although our offices are in the United States, among our members are several Canadian corporations, including Asbestos Corporation Ltd., Atlas Turner Inc., Cassiar Resources Ltd. and Mitsubishi Canada Ltd. Our interest in Canadian views on asbestos, though, goes well beyond representation of our Canadian members as most of the asbestos used by our members is mined in Canada, and many of our members also manufacture and market asbestos-containing products in Canada.

Dr. Stephen Dupre
January 6, 1981
Page Two

AIA/NA is committed to the safe production and use of asbestos and supports appropriate government regulation to ensure the health of persons working with this uniquely versatile and valuable mineral. In this connection, we have participated actively in numerous proceedings concerning regulation of asbestos. Most recently, we submitted comments to the Ontario Ministry of Labour on its proposed new occupational standard for asbestos. Those comments speak directly to one of the seven agenda items of this Commission -- worker exposure to asbestos -- and we enclose a copy for the information of the Royal Commission.

As noted in our comments to the Ministry of Labour, we are confident that an objective and independent review of the asbestos medical evidence -- accumulated in numerous epidemiology studies of exposed workers -- will disclose that there is no substantial evidence of a significant health risk to workers in occupational environments complying with a 2 fibers/cc standard. Accordingly, we urged the Ministry not to impose precipitously its recommended lower standards.

Our comments to the Ministry of Labour also included a detailed description of a proposal AIA/NA has made to the Occupational Safety and Health Administration (OSHA) in the United States for adoption of a work practices approach for regulation of asbestos use in the construction industry and at other non-fixed worksites. In such occupations, high employee turnover rates and inconstant exposure potentials make the normal monitoring, engineering control, and medical surveillance methods of industrial hygiene unduly expensive and of doubtful value.

AIA/NA has, therefore, proposed that asbestos-containing products for the above uses be categorized as (A) releasing no more than 2 fibers/cc under any foreseeable conditions, (B) releasing no more than 2 fibers/cc when used with proper work practices, and (C) not meeting either of the first two criteria. Our proposal calls for no regulation of Category A products, requirements that certified work practices be employed when working with Category B products, and normal occupational regulation of Category C products. The approach thus guarantees worker protection through requirements that can be easily monitored and enforced. It also creates incentives for manufacturers to develop products and work practices that minimize fiber release.

Dr. Stephen Dupre
January 6, 1981
Page Three

We believe this proposal provides a reasonable and useful approach to non-fixed site occupational exposure control that should be of great interest to the Royal Commission and enclose a complete copy of our proposal entitled "Recommended Standard for Occupational Asbestos Exposure in Construction Industry and Other Non-Fixed Work Operations."

Following submission of the foregoing document, OSHA's Advisory Committee on Construction Safety and Health endorsed the work practice approach to occupational safety in the construction industry. In its May 16, 1980, report, the OSHA Committee noted that such an approach "would allow an employer or a material supplier to develop and publish work practices" which, "based on legitimate measuring and monitoring of actual field operations," would "be designed to assure that permissible exposure limits would not be exceeded" for a given product.

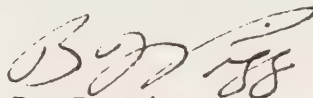
We also enclose nine industry developed booklets describing recommended work practices for persons using asbestos-containing sheet, pipe, floor coverings, paper, friction materials, textiles, and plastics. These booklets describe in detail the types of work practices on which employers and employees can rely to minimize asbestos exposure.

AIA/NA would welcome the opportunity to describe the work practice approach in detail in an oral presentation at the Commission's Phase I hearings. At that time, we would also be glad to address other AIA/NA activities in which the Commission members might be interested. For example, AIA/NA has actively participated in general asbestos standard setting activities at OSHA and has often conferred with the United States Environmental Protection Agency and Consumer Product Safety Commission on various proposals concerning asbestos waste disposal, safe use of asbestos cement pipe, asbestos in schools, and asbestos in consumer, commercial, and industrial products.

Dr. Stephen Dupre
January 6, 1981
Page Four

AIA/NA looks forward to a constructive dialogue with the Royal Commission as your deliberations proceed over the next year.

Sincerely yours,

A handwritten signature in dark ink, appearing to read 'B. J. Pigg', with a stylized flourish at the end.

B. J. Pigg
Executive Director

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Enclosures

List of Appendices to the Submission by
The Asbestos Information Association/North America
(on file at the RCA's offices)

Comments of the Asbestos Information Association/North America on the
Proposed Regulation of Asbestos as a Designated Substance, November 26, 1980. (attached)

Recommended Standard for Occupational Asbestos Exposure in Construction
and Other Non-Fixed Work Operations, prepared by the Asbestos Information
Association/North America and the Association of Asbestos Cement Pipe
Producers, February 7, 1980.

Assorted Booklets:

- (a) "Recommended Work Practices for A/C Pipes"
- (b) "Recommended Work Procedures for Resilient Floor Coverings"
- (c) "Recommended Work Practices: Molding and Fabrication of Asbestos-Containing Plastic Products"
- (d) "Recommended Work Practices for Field Fabrication of Asbestos-Cement Sheet"
- (e) "Recommended Work Practices: Shop and Field Fabrication of Asbestos Sheet Products"
- (f) "Recommended Work Practices: Fabrication and Use of Asbestos Paper Products"
- (g) "Recommended Work Practices: Fabrication and Use of Asbestos Friction Materials"
- (h) "Friction Materials Work Practices Guide"
- (i) "Recommended Work Practices: Use and Handling of Asbestos Textile Products"

ONTARIO MINISTRY OF LABOUR

PROPOSED REGULATION OF ASBESTOS
UNDER
THE OCCUPATIONAL HEALTH & SAFETY ACT, 1978

COMMENTS OF THE ASBESTOS INFORMATION
ASSOCIATION/NORTH AMERICA ON THE
PROPOSED REGULATION OF ASBESTOS
AS A DESIGNATED SUBSTANCE

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November 26, 1980



ASBESTOS INFORMATION ASSOCIATION

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November 26, 1980

Robert G. Elgie, M.D.
Minister of Labour
400 University Avenue
Toronto, Ontario
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Dear Dr. Elgie:

The Asbestos Information Association/North America (AIA/NA), representing more than 50 companies who mine, process and manufacture asbestos and asbestos-containing products in the United States and Canada, welcomes this opportunity to comment on the Ministry of Labour's proposed new asbestos regulation. AIA/NA shares with the Ministry the goal of improving occupational safety and health through encouraging safe use of asbestos.

AIA/NA believes that it would be unwarranted for the Ministry of Labour to impose the lower permissible exposure levels for asbestos contained in its proposed regulation. The asbestos medical evidence, almost all of which is predicated on the health effects experienced by workers in the past at exposure levels many times higher than those in the workplace today, does not demonstrate the significant evidence of health hazard that we believe is necessary to justify this more stringent regulation. Although various recommendations have been made in the United States and in European countries to impose a workplace standard more stringent than 2 fibers/cc, such recommendations have not yet been implemented.

AIA/NA also believes that several practical considerations relevant to effective enforcement of a lower workplace exposure standard militate against implementation of the proposed regulation without further study.

First, significant difficulties exist in establishing a legally enforceable standard at 1 fiber/cc or lower levels given the limitations of optical microscopy. Measurements at such low levels are of limited accuracy and show great variability.

Robert G. Elgie, M.D.
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Second, the proposed regulations are not well-suited for the distinctive problems presented in achieving safer working conditions in the construction industry and at other non-fixed worksites. At such sites, high employee turnover rates and inconstant exposure potential make the normal monitoring, engineering control and medical surveillance methods of controlling asbestos exposure expensive and of doubtful value. AIA/NA has developed a flexible enforcement scheme for occupational exposures in such workplaces, relying on use of certified work practices, rather than monitoring, to ensure safe working conditions. We enclose with our comments a detailed description of that proposal, as prepared for an advisory committee of the U.S. Occupational Safety and Health Administration earlier this year.

In sum, we believe the Ministry would be best-served by deferring imposition of new regulations on asbestos occupational exposure until: (a) thorough scrutiny of the medical evidence both by the Ontario Ministry of Labour and Royal Commission and by the worldwide health and safety community has been completed; and (b) amendments to the proposal are made to incorporate a more flexible and more effective means of regulating asbestos use in the construction industry.

Respectfully yours,


B. J. Pigg
Executive Director

Enclosure

cc: Designated Substances Project
Standards and Program Branch
Ministry of Labour

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Recommended Work Practices, Use and
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Recommended Work Practices, Molding
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COMMENTS OF THE ASBESTOS INFORMATION
ASSOCIATION/NORTH AMERICA ON THE
REGULATION OF ASBESTOS AS A DESIGNATED SUBSTANCE

INTRODUCTION

The Asbestos Information Association/North America (AIA/NA), a non-profit organization representing more than 50 companies engaged in the mining, manufacture and marketing of asbestos and asbestos-containing products in the United States and Canada, is pleased to present to the Ontario Ministry of Labour comments on its proposed new regulation of asbestos as a designated substance.

AIA/NA is committed to the safe production and use of asbestos and supports appropriate regulation to ensure the health of persons working with this uniquely versatile and valuable mineral. We urge the Ministry of Labour, however, to reconsider whether there is a sound basis to believe that its present regulatory scheme is inadequate.

We are confident an objective and independent review will disclose no substantial evidence of a significant health risk at 2 fibers/cc, in the absence of which stricter control limits are not justifiable.

In addition, we suggest several issues concerning monitoring, enforcement policy, and application of the standard to the construction industry that deserve careful scrutiny prior to implementation of new regulations.

Prudent public policy suggests that substantial additional costs should not be imposed on industry to achieve essentially speculative increases in health protection. In this respect, a recent ruling of the United States Supreme Court provides valuable guidance for the proper administration of health and safety regulation. While not binding on the Ontario government, this decision contains perceptive insights into the constraints, both practical and prudential, that should be considered by any health and safety regulatory body.

In proposing to revise the current control limit for occupational exposure, the Ministry has placed primary reliance on the Report of the British Advisory Committee on Asbestos and three other reports prepared or commissioned by government organizations to review the evidence on the health effects of exposure to asbestos. None of these sources provides a basis from which to ascertain the true risks of exposure to asbestos at or below 2 fibers/cc. The data on the risks of such low level exposure to asbestos remain equivocal, but there is reason to believe the risks are lower than predicted by extrapolation from high dose exposure data and may likely be insignificant.

At present, the issue of appropriate control measures for exposure to asbestos is under active study by administrative agencies or other government-sponsored bodies in the United States, the United Kingdom, and the European Economic

Community. In addition, a Royal Commission is currently assessing the health effects of asbestos in Ontario. The health risks of asbestos at current exposure levels are not so demonstrably great that it is necessary to push through new regulations without an adequate period of study. The results of these on-going investigations should be obtained and studied before the present control limits are modified.

At the same time as results of these comprehensive reviews of the health evidence are awaited, the Ministry of Labour could profitably consider several provisions of the Proposed Regulations that deserve further study in light of technical and practical limitations.

First, the practical limitations on monitoring asbestos at low levels present considerable difficulties for enforcement of the new proposed standard for Ontario. Given the variations that will inherently occur in monitoring asbestos at low levels, neither industry nor government can rely with great confidence on such measurements to determine whether a workplace is in compliance. Indeed, in light of the variations that occur in monitoring workplaces today, an employer must in reality be maintaining exposure levels below 1 fiber/cc in order to obtain measurements that can demonstrate with confidence compliance with the existing 2 fiber standard.

Second, in the construction industry, high employee turnover rates and inconstant exposure potentials make the

normal monitoring, engineering control and medical surveillance methods of controlling asbestos exposure expensive and of doubtful value. AIA/NA has thus designed a work practice method of regulation by which the Ministry could achieve the protection of worker health, provide market incentives for manufacturers to increase the safety of their asbestos-containing products, and accommodate the practical realities of the construction industry. Enclosed with our comments is a detailed description of such a scheme.

- I. SOUND PUBLIC POLICY REQUIRES RETENTION OF THE PRESENT STANDARD ABSENT PROOF THAT A REDUCTION OF THE CONTROL LIMIT WOULD RESULT IN A SIGNIFICANT REDUCTION OF RISK.

In view of the cost and economic disruption that may be necessary to meet a lower asbestos standard, prudent public policy dictates that the present standard should not be changed without substantial evidence that the risk at 2 fibers/cc is significant and that moving to a lower standard would measurably reduce that risk. It is not in the public interest to impose substantial economic burdens on industry to achieve minimal or speculative reductions in health risks. As the proponent of changing the status quo, the Ministry of Labour ought properly to bear the burden of demonstrating that the new regulation is necessary to deal with significant hazard and will result in real health benefits.

The United States Supreme Court recently explored these issues in a decision in which it ruled that the U.S. Occupational Safety and Health Administration (OSHA) must demonstrate a significant risk and a significant reduction of risk before it may revise existing health standards. We do not, of course, contend that the Supreme Court's decision is in any way binding in Ontario. The Court's decision is, however, grounded not only on construction of OSHA's statutory authority, but also on consideration of the proper bases for the exercise of governmental authority in health and safety regulation. The reasons given by the Supreme Court for its decision may be a valuable guide to the Ministry as it examines the factual support for its proposed regulation.

A. The U.S. Benzene Case Establishes Sound Principles for Occupational Health and Safety Standard Setting in Canada.

The Supreme Court's decision in Industrial Union Department, AFL-CIO v. American Petroleum Institute, 100 S.Ct. 2844 (1980) (copy enclosed, Attachment I), invalidated OSHA's requirement of lower permissible exposure levels for benzene, a common petrochemical feedstock long known to cause adverse health effects if inhaled in large quantities. Known as the "benzene case," the decision addresses issues of law and policy fundamental to the regulation of toxic substances in any society.

In 1978 OSHA issued an occupational safety and health standard reducing the permissible exposure limit for benzene to 1 ppm from the prior standard of 10 ppm. The statement accompanying the standard contained an extended review of the medical evidence on the effects of exposure to benzene; but, reduced to its essentials, OSHA's rationale for reducing the exposure standard was as follows: (1) there is substantial evidence that exposure to high concentrations of benzene can lead to leukemia; (2) industry has failed to prove a safe threshold exposure level below which no excess cancer deaths will occur; (3) as a matter of policy, OSHA assumes that in the absence of proof of a risk-free level of exposure, any exposure to a carcinogen presents some increased risk of cancer; and (4) OSHA must set a standard at a demonstrated safe level or at the lowest level achievable, whichever is higher. OSHA selected 1 ppm as a technologically achievable level for which compliance costs would not bankrupt the industry.

The Supreme Court rejected OSHA's justification for the 1 ppm standard.^{1/} Congress did not intend, the Court found, to require employers to provide risk-free workplaces. Thus,

^{1/} The Court's decision was not unanimous. Four of the nine justices dissented. The five members of the majority could not agree on a single rationale for invalidating the standard. The discussion in the text reflects the views of four justices as expressed in the lead opinion by Mr. Justice Stevens. Under U.S. law, this is the holding of the Court. See Marks v. United States, 430 U.S. 188, 193 (1977).

OSHA could not reduce the exposure limit for a substance unless it determined that a "significant risk" of material health impairment existed under the old standard and that a reduction in the standard would significantly reduce the risk. The Court interpreted OSHA's statute to require a finding, based on substantial evidence, that working conditions were "unsafe" in the sense that "significant risks are present and can be eliminated or lessened by a change in practices," before a more stringent exposure limit could be required. 100 S.Ct. at 2864.

The Court then proceeded to allocate the burden of proof on this significant risk issue to the regulating agency. The ordinary rule in administrative proceedings is that the proponent of a rule or order bears the burden of persuasion, and the Court found no reason to depart from that rule for the OSHA benzene standard.

Finally, the Court examined the justification offered by OSHA for the new standard and determined that the agency had not fulfilled its obligation to produce substantial evidence that the risks from exposure to 10 ppm of benzene, the old standard, were significant, nor that reducing the control limit to 1 ppm would significantly reduce the risk. The Court dismissed OSHA's rationale as a mere "series of assumptions" and particularly noted the lack of any firm evidence that exposure to 10 ppm of benzene posed a leukemia risk or any other significant health risk. 100 S.Ct. at 2859-60.

The Agency was found to have relied impermissibly on a theory that because there was a demonstrated risk at high dose exposure to benzene, there was some risk, albeit unquantifiable, at low doses. OSHA had incorrectly attempted to reduce exposures as low as possible, even though the low dose risks might well be insignificant. The Court held that before OSHA may lower an exposure standard, it must have credible scientific evidence that "it is more likely than not" that a significant risk is present that would be reduced by changing the standard. 100 S.Ct. at 2869.

B. The Ministry of Labour Should Be
Guided by the Principles of the
Benzene Case in Regulating Asbestos.

The U.S. Supreme Court's decision in the benzene case, and its discussion and interpretation of the restraints on OSHA's authority, have value beyond the simple construction of U.S. law. The benzene decision explicates principles of sound public policy universally applicable to health and safety regulation in democratic societies.

The fundamental tenet of the benzene case is that it is not reasonable to attempt, through regulation, to reduce occupational risks to zero. As Chief Justice Burger stated in his concurring opinion:

When the administrative record reveals only scant or minimal risk of material health impairment, responsible administration calls for avoidance of extravagant, comprehensive regulation. Perfect safety

is a chimera; regulation must not strangle human activity in the search for the impossible.

100 S.Ct. at 2875. The Court quite correctly declined to assume that Congress intended for OSHA to impose enormous costs on industry in order to achieve minimal and speculative health gains.

There are disturbing signs that the Ministry of Labour has adopted for asbestos a regulatory philosophy that largely coincides with that for which OSHA was chastised in the benzene case. As explained in the next section, the evidence linking asbestos with cancer is derived from exposure many years ago to high, often uncontrolled, concentrations of asbestos dust. Yet, the Interim Report on the Designation of Asbestos in Ontario, which sets forth the basis for the proposed regulation, states that because asbestos is carcinogenic, exposure should be controlled "as low as possible."^{2/}

In practical effect, this approach assumes unlimited authority to regulate without an obligation to find that a hazard worthy of regulation exists. Following this philosophy, the Ministry could propose the most stringent controls based only on the mere possibility that someone somewhere might

^{2/} Interim Report, at 17, 19. The Ministry staff has indicated that the Final Report will state that exposures should be reduced below the levels that prevailed 20 or 30 years ago. We agree completely. However, present exposures are already far below what they were in years past. The issue is whether they should be reduced still further, at considerable cost, with little meaningful evidence that any significant health risks will thereby be avoided.

confront some risk of cancer. The U.S. benzene case should provoke sober reflection on whether this is a prudent policy for Ontario officials to follow and whether there is any firm evidence of a significant health hazard at the present 2 fiber standard.

II. THE MEDICAL EVIDENCE ON THE HEALTH EFFECTS OF ASBESTOS, DERIVED FROM HISTORICAL HIGH EXPOSURES, PROVIDES AN INSUFFICIENT BASIS TO DOCUMENT A SIGNIFICANT HEALTH HAZARD AT THE PRESENT 2 FIBER CONTROL LIMIT.

The control limits for exposure to asbestos set forth in the Proposed Regulation are taken from recommendations in the Final Report of the British Advisory Committee on Asbestos (the "Simpson Report"). While the Simpson Report represents a substantial effort to reach concrete conclusions in the face of manifold uncertainties, it is not without limitations and should not substitute for the Labour Ministry's independent assessment of the need to reduce the present standard. In making that assessment, the Ministry should itself critically evaluate, on the basis of all available evidence, the risks of exposure to asbestos at 2 fibers/cc.

We note first that the proposals in the Simpson Report are recommendations only. They have to date not been adopted by the United Kingdom government, which commissioned the report. In fact, there is considerable on-going debate in the United Kingdom on the Simpson Report recommendations.

Moreover, while the Simpson Report includes a comprehensive survey of the medical evidence on the health effects of asbestos, the recommended control limits are based on the data from only three studies. Each of these studies makes predictions of the probable effects of exposure to low levels of asbestos dust based on observations of the results of high dose exposures. As the authors of the Report candidly concede, "there is plenty of room for differences of opinion about the validity of the conclusions reached in this section." (Simpson Report, vol. 1, at 54).

The Simpson Report recommendations should not be adopted without an appreciation of the constraints of the data on which they are based, nor without consideration of the evidence suggesting that the risks of exposure to low concentrations of asbestos are much lower than the Simpson Report predicts. An evaluation of all the available evidence demonstrates that the medical basis for revising the present 2 fiber standard is tenuous indeed.

- A. The Simpson Report's Dose Response Curve is Based on Data from Past High Dose Occupational Exposure Far in Excess of Any Experienced by Today's Workers.

Calculation of a dose/response relationship for exposure to asbestos dust was crucial to the development of the recommended control limits in the Simpson Report. (Report, vol. 1, at 53). It is generally accepted that increased exposure to asbestos dust results in an increased risk of

death from asbestos-related disease, but the precise correlation between dose and health risk has been difficult to define. This is particularly true for the low exposure levels now experienced by asbestos workers. Historically, dust levels have been much higher and there is a long latency period between exposure and first appearance of disease. Hence, there is little direct evidence from which to assess the long term effects of low occupational exposure. To date, there is virtually no published data on any group of workers exposed throughout their working lives at below the 2 fiber standard.

The Simpson Report's control limits are based on a linear, non-threshold dose response curve derived from three studies that provide some quantitative dose response data for asbestos and lung cancer. Each of these studies -- Rochdale,^{3/} Enterline,^{4/} and McDonald^{5/} -- however, relies principally on evidence of excess mortality among workers with high cumulative dust exposures to predict a risk of premature death at low exposure. The validity of the proposed

^{3/} Peto, J., "The Hygiene Standard for Chrysotile Asbestos," Lancet (March 4, 1978).

^{4/} Enterline, P., Decoufle, P., Henderson, V., "Mortality in Relation to Occupational Exposure in the Asbestos Industry," 14 J. Occ. Med. 897 (1972).

^{5/} McDonald, A. D., "Dust Exposure and Mortality in Chrysotile Mining, 1910-75," 37 Br. J. Ind. Med. 11 (1980). Unpublished data from this study was considered in preparation of the Simpson Report.

control limits is therefore dependent on extrapolation from high to low dose mortality rates.

Enterline, for example, acknowledges that the historic dust levels to which the workers in his study cohort were exposed were high, sometimes in excess of 50 mppcf. The mean cumulative exposure for both production and maintenance workers was in excess of 230 mppcf-years. The study also points out that the exposures for maintenance workers, who showed greater excess mortality than production workers, was characteristically intermittent and therefore probably higher for single dose exposures.

Exposure data from the asbestos textile factory at Rochdale show that worker groups that exhibited significant excess mortality from lung cancer were exposed to dust concentrations far above the present occupational standard. The average cumulative dose exceeded 200 fiber-years/cc with average dust levels of 13 fibers/cc in the early years of exposure. The Rochdale data is of particularly limited usefulness because of the small size of the worker cohort and the absence of individual dose data, thus making it impossible to construct a dose response curve or to test the linear dose response assumption. In addition, the estimated fiber counts would have to be increased by a factor of two to five before comparison with modern measurements would be

appropriate.^{6/} Indeed, recent preliminary recalculations of the Rochdale dust counts for 1951 to 1974 to adjust for modern counting methods have resulted in substantially higher estimates than previously reported -- on the order of three times higher for the earlier counts.^{7/}

In the McDonald study of Quebec chrysotile mining and milling workers, the cohort was divided into four groups according to accumulated total dust exposure. For workers with at least 20 years work service, clear excess mortality trends appeared only for the two highest groups, i.e., those with more than 300 mppcf-years exposure. The average dust exposure levels for these two groups were 19.2 and 46.8 mppcf respectively.

Beyond the great uncertainties in extrapolating from the historical high dose exposures to the levels of exposure existing in the workplace today, the Simpson Report risk assessment does not account for the impact of smoking on the studied cohorts. Given the compelling evidence that asbestos-related disease is by far most pronounced among smokers, and the great likelihood that today's workers do not smoke as

^{6/} See Simpson Report, vol. 2, at 35, where it is noted that shifts in the last decade from static to personal sampling and from "whole field" to eyepiece graticule counting methods has resulted in a substantial de facto tightening of the occupational control limit.

^{7/} Peto, J., "Lung Cancer Mortality in Relation to Measured Dust Levels in an Asbestos Textile Factory," IARC Meeting, Lyon, France, Sept. 1979, on Biological Effects of Mineral Fibers (to be published).

heavily as did the workers in these three cohorts, this risk assessment may significantly over-estimate current workplace risks.

The dependence of these studies on high dose exposure data and the failure to isolate the effects of smoking do not render them useless or incorrect. These factors do, however, demonstrate that the Simpson Report does not constitute the significant evidence of risk for workers at present exposure levels that should be required to justify a lower asbestos standard.

B. Low Dose Data Suggests the Absence of Any Significant Hazard

The estimation techniques used in the Simpson Report should not obscure the fact that much evidence available on the effects of low dose exposure to asbestos tends to indicate that the risks to workers are very small, if not insignificant.

The authors of the McDonald study, for example, are careful to point out that

[i]f the only subjects studied had been the 1904 men with at least 20 years' employment in the lower dust concentrations, averaging 6.6 million particles per cubic foot (or about 20 fibres/cc), excess mortality would not have been considered statistically significant, except for pneumoconiosis.

McDonald at 11. The "lower dust concentrations" in the McDonald study were, of course, many times greater than the current 2 fiber standard.

A recent study of asbestos-cement workers also indicates that low level asbestos exposure risks are very small.

Weill, et al., have reported on the mortality experience of a cohort of 5,645 workers in two asbestos cement factories in Louisiana with follow-up beginning twenty years after first exposure.^{8/} Exposure estimates were based on records of measurements of total airborne particulates begun in the early 1950's, prior to which time no significant dust control measures were in effect. The study focused on the risk of death from malignant respiratory disease. The authors conclude:

In this study, whereas excess risk of respiratory cancer was detected in workers with moderate and heavy exposure, the categories of lowest exposure to asbestos dust did not exhibit excess risks of respiratory malignancy. Such findings are not necessarily incompatible with a linear response curve at low doses because of the relative insensitivity of currently used epidemiologic methods in detecting slight increases in risk when compared to background. They do indicate, however, that any excess risks at low degrees of exposure are small.

Weill, at 353. No excess mortality from respiratory malignancy appeared below 100 mppcf-yrs. Id. at 348, Table 2. Converting this finding to fiber-yrs/cc, using the smallest

^{8/} Weill, H., Hughes, J., Waggenpock, P., "Influence of Dose and Fiber Type on Respiratory Malignancy Risk in Asbestos Cement Manufacturing," 120 Am. Rev. Resp. Disease 345 (1979).

conversion factor from the Simpson Report,^{9/} yields 100 fiber-yrs/cc, a level that would indicate no risk from a 50 year occupational exposure to 2 fibers/cc.

While these results can not prove that the extrapolation techniques utilized as the basis for the Simpson Report recommendations are wrong, they do point up the tentative and equivocal character of current knowledge of the real risks of exposure to the low levels of asbestos found in the workplace today. They further indicate that whatever risks exist are small, quite likely much smaller than the estimates based on high dose data suggest. In the continuing debate over the nature of the disease hazard associated with asbestos, the Simpson Report is by no means the last word.

C. Other Sources Upon Which the Ministry
Has Relied as the Basis for the
Proposed Regulation Do Not Support It.

Members of the Ministry staff have indicated three sources in addition to the Simpson Report as primary bases for the Proposed Regulation: "Effects of Asbestos in the Canadian Environment," NRCC Report 16452 (1979); "Public Health Risks of Exposure to Asbestos," Report of a Working

^{9/} As recognized in the Simpson Report, the conversion from particulate to fiber counts is problematic. (Report, vol. 2, at 85-87). The Report uses a range of conversion factors from one to five. Moreover, the actual average exposure for employees will be one-half to one-tenth the regulated control limit, thus providing a further safety margin. See Simpson Report, vol. 1, at 73 ¶ 171.

Group of Experts to the Commission of the European Communities (1977); and "Workplace Exposure to Asbestos," Report of the NIOSH-OSHA Asbestos Work Group (1980). None of these sources provides any stronger basis to revise the present 2 fiber/cc standard than the Simpson Report.

The NRCC Report is simply a compilation of available literature on asbestos. It contains little, if any, critical evaluation and identifies no quantitative data not considered in the Simpson Report that could aid in the determination of the true risks of low dose exposure. The second EEC report is similar, although more evaluative. As its title suggests, however, it is focused on public health risks rather than occupational risks and devotes little attention to workplace exposure. Neither report recommends any control limits for occupational exposure.

The NIOSH-OSHA Work Group Report is also a survey, focused on the medical evidence, but it includes some more recent material, and, unlike the Canadian and EEC reports, purports to evaluate the evidence and recommend exposure limits. The defects and biases in this document are far too numerous to list here, but its conclusions are seriously flawed and should not be relied upon. The basic format of the Report is a superficial review of all the studies linking asbestos exposure and cancer -- disregarding completely the lack of exposure data in most of the studies -- from which the authors conclude that the control limit should be set at

the lowest detectible level. It is particularly noteworthy that this report was prepared prior to the Supreme Court's decision in the benzene case, and thus fails to include the type of comprehensive and objective review of health evidence now clearly required for U.S. OSHA regulations.

Even in reviewing the quantitative studies, the NIOSH-OSHA report distorts their results. As just one example, the finding of Weill, et al., of no excess respiratory cancer among workers with less than 100 mppcf-yrs cumulative exposure is noted, but the results are discounted because the methods of trace may have resulted in an underreporting of deaths. The NIOSH-OSHA summary fails to point out that the Weill study also found a complete overlap (within the 95 percent confidence interval) of the standard mortality ratios for both overall mortality and respiratory cancer deaths for all of the lower exposure categories. This supports the absence of excess lung cancer deaths despite the possibility of underestimation of total deaths.^{10/}

In sum, the additional sources relied upon as the basis for the Proposed Regulations provide no firmer evidence of the presence of a significant risk at present exposure levels.

^{10/} Weill, 120 Am. Rev. Resp. Disease at 348, 349 fig. 1.

III. DETERMINATION OF APPROPRIATE WORKPLACE EXPOSURE CONTROLS IS UNDER STUDY IN SEVERAL COUNTRIES, AND ONTARIO WOULD BENEFIT FROM THE RESULTS OF SUCH STUDIES.

Investigations into the hazards of exposure to asbestos and what measures should be taken to control them are going forward in several countries. In the United States, both OSHA and the Environmental Protection Agency are actively exploring both workplace and ambient exposures. There has been continuing debate in the United Kingdom since the publication of the Simpson Report over whether its recommendations should be implemented. The Environment & Consumer Protection Service of the Commission of the European Communities is gathering data relevant to the development of regulations for the emission of asbestos from factories and waste disposal sites. None of these governmental bodies has yet enacted any revisions of the current permissible exposure limit to below 2 fibers/cc.

In addition, in Ontario a Royal Commission has been appointed to investigate all matters relating to health and safety arising from the use of asbestos in Ontario. The activities of the Royal Commission are not necessarily inconsistent with the Ministry of Labour's proposal to issue new regulations for occupational exposure to asbestos, but it is also clear that the development of new regulations would benefit from the information and insights of the Royal Commission and the other on-going investigations. In this

regard, it will not be necessary to wait for the Commission's final report, for, as Chairman Dupre pointed out in his opening remarks at the first public meeting of the Commission, interim reports will be issued on severable issues when appropriate.

The health evidence gathered thus far by the Ministry constitutes a far from compelling case for more stringent regulation of asbestos. The several study initiatives under way in Ontario and in other countries may provide a more solid basis on which to make policy decisions regarding the control of asbestos, and it would be well to await their reports.

IV. CERTAIN PROVISIONS OF THE PROPOSED
REGULATION SHOULD BE MODIFIED IN THE FACE
OF PRACTICAL BARRIERS TO IMPLEMENTATION.

At the same time as the results of the comprehensive reviews of the health evidence are awaited, the Ministry could profitably consider several issues that are central to effective enforcement of an asbestos standard and thus effective protection of workers. The variability and unreliability of monitoring asbestos concentrations at the low levels proposed in the new regulations poses significant difficulties for industry in achieving compliance and for the government in monitoring industry. In addition, the unique situation of the construction industry, where workers are very mobile and exposures quite intermittent, poses

particular difficulties for compliance and enforcement if traditional medical surveillance, engineering controls and monitoring are relied on for worker protection.

A. Limitations of Monitoring at Low Exposure Levels Present Significant Problems for the Proposed Regulation.

The limitations of optical microscopy in accurately measuring airborne concentrations of asbestos in the workplace at the proposed control levels present significant problems that must be addressed before an effective standard can be implemented. Available data indicate that measurements at levels at and below the current 2 fiber standard are of limited accuracy and show great variability. The extent of the imprecision in monitoring at the proposed levels is, in fact, so substantial as to create serious, if not insurmountable, compliance burdens for employers and severe enforcement difficulties for regulatory authorities.

Despite its limitations and inaccuracies, the membrane filter method is the monitoring technique most widely used today, and is recognized as the "only practicable alternative at present."^{11/} Because of its relatively long and widespread use, this method has been studied extensively and the sources of error in the method have been successfully

^{11/} See Asbestos: Measurement and Monitoring of Asbestos in Air, Second Report by the United Kingdom Advisory Committee on Asbestos to the Health and Safety Commission 1978, at 15.

identified. Variations in the precision of the method stem from both random and systematic errors in virtually every aspect of the sample collection and sample evaluation processes.

Even though these variations are well-documented, their quantification has proven difficult and the degree of imprecision in the method remains controversial. Nevertheless, it is clear that the degree of imprecision increases as the permissible exposure limit decreases because of the greater demands placed on the sampling and analytical procedures currently employed. The impact of this increasing imprecision on the reliability of the monitoring method is substantial and casts serious doubt on the workability of occupational exposure limits below the current two fiber standard.

In the most recent and comprehensive study of the reliability of the membrane filter method,^{12/} all sources of

^{12/} This study was conducted by the Air Monitoring Committee of AIA/NA in cooperation with 46 laboratories and is currently being prepared for publication. Once published, we will make the full report available to the Ministry. In the AIA/NA study, pairs of sample filters were collected simultaneously in the worker's breathing zone. One filter from each pair was counted by the laboratory that collected it and the other by a randomly selected second laboratory. An additional count by another laboratory on the same filter was also obtained for approximately 25% of the filters. A limited number of laboratories also provided counts on the same filter by two or more counters. Approximately 900 pairs of sample filters were collected and analyzed, yielding substantial information on the variability of the monitoring method.

variability, including inter-laboratory differences, were analyzed and a coefficient of variation^{13/} was calculated according to standard statistical procedures. Results of this study indicate that at exposure levels below the current 2 fiber/cc standard, the coefficient of variation is approximately 0.5.^{14/} As illustrated in the following table, this coefficient of variation results in a substantial range of values in monitoring results at each of the proposed exposure levels:

Actual Concentration (f/cc)	Confidence Level	Expected Variations (f/cc)
(1)	1.0	90% .41 to 1.94 95% .36 to 2.25 98% .27 to 3.0
(2)	0.5	90% .21 to 0.97 95% .18 to 1.12 98% .13 to 1.5
(3)	0.2	90% .08 to 0.39 95% .07 to 0.45 98% .03 to 0.6

The implication of such extensive variation in monitoring measurements at the proposed control limits is far-reaching. For example, the above data indicate that if the actual

^{13/} The coefficient of variation is expressed numerically and provides a measure of the variation in the precision of the method under routine sampling conditions.

^{14/} The degree of imprecision in the monitoring method increases as the permissible exposure limit decreases. Therefore, the coefficient of variation determined from the data was not precisely the same for all three control limits. The value 0.5 is an approximate average of the actual coefficients of variation.

concentration is 1.0 fiber/cc, 95% of the measurements will fall between .36 and 2.25 fibers/cc. In other words, when "true" dust levels are at 1 fiber/cc, the membrane filter method will, nineteen times out of twenty, yield measurements anywhere from .36 to 2.25 fibers/cc.

In practical terms, this extensive variation in the precision of the monitoring method creates difficulties for both industry and government.

First, in order to be certain of compliance, employers must implement workplace controls that reduce exposure levels far below the purported standards. For example, to comply with the proposed standard of 1 fiber/cc, an employer would have to implement workplace controls which reduced the actual concentration of asbestos below .5 fibers/cc. By achieving an actual concentration of .5 fibers, the employer would consistently (i.e., 95% of the time) achieve measurements at or below 1.12 fibers/cc.

For the same reasons, it is clear that a proposed standard of either .5 or .2 fibers/cc would be unrealistic. In order to ensure compliance with such very low standards, employers would have to implement workplace controls that reduced actual concentration levels well below the standard (approximately to .2 to meet a .5 standard or below .03 to meet a .2 standard). Such very low concentration levels are clearly beyond current technological capability.

This same factor demonstrates that in order to be confident of meeting the existing 2 fiber standard, employers must already be achieving actual concentrations in the workplace well below 2 fibers. Indeed, the data above indicates that the actual concentrations in workplaces today must actually be below 1 fiber/cc for employers to have confidence, given the variations in monitoring, that they are meeting the existing standard.

Second, the degree of imprecision in the monitoring method creates significant enforcement difficulties for regulatory authorities. For example, at the proposed standard of 1.0 fiber/cc, where 95% of the measurements will fall between .36 and 2.25 fibers/cc, an employer whose measurements consistently fall above 1.0 but below 2.25 fibers must be held to be in compliance with the standard. The reason is that the measurement on the high side of the standard (above 1.0 f/cc) is as equally persuasive evidence of an actual exposure level of 1.0 f/cc, as is a measurement on the low side of the standard.

Such uncertainty in legally enforceable standards creates a serious problem of fairness to employers. Without clear notice of what conduct is expected of them and an ability to determine whether they are conducting themselves as is legally required, employers are placed in an untenable position.

In sum, the significant documented variations that occur in monitoring asbestos at low levels impact on the Ministry's proposed standard in two respects.

First, the existence of such variations demonstrates that in order to be in compliance with the existing 2 fiber standard, employers must in fact maintain asbestos levels below 1 fiber if they are to have any confidence that they are complying with the standard. Or, in other words, the variability inherent in the monitoring method means that the actual asbestos levels in the workplace are already likely to be below the proposed standard of 1 fiber/cc.

Second, the significant monitoring variations, variations that are more pronounced the lower the permissible exposure level, cause great uncertainty for both industry and government in determining whether compliance has been achieved. Unless these monitoring difficulties are fully considered in developing an asbestos regulation, the result may be to promulgate a standard that is unlikely to provide meaningful guidance to employers or a workable benchmark for enforcement.

B. The Proposed Regulation Will Prove Unworkable
for the Construction Industry, and More
Effective Alternatives Are Available.

Although the proposed regulation appears to contemplate a relatively flexible approach to the development of asbestos control programs, certain mandatory provisions will be both impractical and ineffective for the unique circumstances of

the construction industry. The features that distinguish construction work from the fixed site workplace for which health and safety regulations are ordinarily designed include: high employee turnover due to a transient and temporary workforce; predominance of small firms with a high failure rate due to wide seasonal variation in demand; and the nature of construction work, i.e., multiple discrete outdoor tasks with no regularity of worker movement among them and inconstant potential exposure to asbestos.

In this setting, many of the provisions appropriate for fixed site "manufacturing" type workplaces are impractical. For example, monitoring at construction sites is a virtually meaningless, yet very expensive exercise. It is meaningless because there is no consistency to the circumstances of exposure among worker tasks, and expensive because essentially constant monitoring might be required to get a representative sample.

The provisions of the proposed regulation for medical surveillance and record keeping are especially burdensome for construction employers. The high rate of turnover among employees would mean large numbers of expensive pre-employment medical examinations. The itinerant nature of the workforce makes the long record retention requirement very onerous, and the high failure rate of small employers would mean that many of those records would end up in the Ministry's custody.

AIA/NA has recently studied these problems in the United States and developed, in conjunction with the Association of Asbestos Cement Pipe Producers, an alternative Recommended Standard for Occupational Asbestos Exposure in Construction and Other Non-Fixed Work Operations. We invite your attention to the enclosed copy of our proposal and a detailed explanation of its features and advantages.

Briefly, the model standard relies on product categorization and certified work practices rather than engineering controls and monitoring to control asbestos exposures. For those products that testing revealed no release of more than 2 fibers/cc under any foreseeable conditions of installation or use, no exposure controls would be required. The Ministry would not itself have to determine what individual products meet these criteria as "Category A" products, but could specify laboratories qualified to do the testing or set standards for the acceptance of manufacturer tests.

For a second category of products, Category B, for which testing revealed potential releases in excess of 2 fibers/cc under some conditions, but for which exposures could be held below that level through the use of proper work practices, the model standard would require that the materials be handled only in accord with approved work

practices. The certification of proper work practices could also be done through independent laboratories.^{16/}

For the third category of asbestos-containing products, Category C, which covers all materials not meeting the criteria of A or B, the general asbestos control regulations would apply. There is no requirement for medical surveillance where only Category A and B products are in use, since, by definition, exposures are below the control limit.

The Model Standard provides significant advantages over the normal fixed-site regulation both for enforcement and compliance purposes. At worksites where only Category A and B products are in use, inspectors could ascertain through visual inspection alone whether the employer was in compliance by simply checking that certified work practices were being followed and no Category C products were present. This would avoid the necessity of monitoring, waiting for analysis of the samples, and then returning to the worksite to charge any violations, by which time the nature of the work being performed might have changed completely.

For similar reasons, employers would have an incentive to select and use Category A and B products as much as possible. Ensuring their own compliance with the regulation

^{16/} A technical appendix to the model standard discusses proper work practice for A-C pipe, A-C sheet, and drilling mud additives. In addition we enclose several booklets on recommended work practices for use in working with other asbestos-containing products.

would thereby be facilitated, and they would not have to undertake costly medical surveillance measures since, by definition, exposures would be below the control limit. In the face of demand from construction contractors, manufacturers would have a substantial incentive to develop and market products that meet the criteria of Categories A and B.

The Model Standard, which could be easily adapted to Ontario's Proposed Regulation, would introduce free market inducements in aid of the government/industry cooperation that will be necessary to make any asbestos exposure control program succeed. We urge the Ministry to give it careful consideration.

CONCLUSION

AIA/NA is committed to the safe production and use of asbestos and supports appropriate regulation to ensure the health of persons working with this uniquely versatile and valuable substance. We cannot, however, share the view expressed by the Ministry of Labour in its proposed new asbestos regulation, that sufficient evidence exists to justify reducing the permissible workplace exposure standard. Especially in light of the on-going studies of the health effects of asbestos in Ontario and in the worldwide health and safety community, we believe it would be unwarranted for Ontario to impose a new lower standard for asbestos concentrations now before the results of these reviews are known.

AIA/NA also believes that Ontario would be well served by adoption of a scheme for regulating exposure to asbestos in the construction industry and at other non-fixed worksites that relies on certified work practice requirements, rather than on the traditional monitoring, engineering control and medical surveillance techniques. As outlined in detail in our enclosed proposal, as made to an OSHA advisory committee, we believe the work practices regulatory scheme will be considerably less costly for employers while at the same time providing increased worker protection. We urge the Ministry of Labour to consider this proposal carefully in its continued deliberations.

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RECOMMENDED STANDARD FOR OCCUPATIONAL
ASBESTOS EXPOSURE IN CONSTRUCTION
AND OTHER NON-FIXED WORK OPERATIONS

The Asbestos Information
Association of North
America

and

The Association of Asbestos
Cement Pipe Producers

February 7, 1980

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RECOMMENDED STANDARD FOR OCCUPATIONAL
ASBESTOS EXPOSURE IN CONSTRUCTION
AND OTHER NON-FIXED WORK OPERATIONS

I. INTRODUCTION

There is a growing recognition that many components of the health standards customarily adopted by the Occupational Safety and Health Administration (OSHA) for fixed-worksite jobs in manufacturing industries do not appreciably advance OSHA's worker health goals when applied to construction and other non-fixed work operations. OSHA acknowledged over four years ago "that alternative . . . controls may be more appropriate and feasible for the construction industry" because of "the uniqueness of the construction industry itself (viz., the multiplicity of non-fixed workplaces, and the utilization of highly transient workforces)." 40 Fed. Reg. 47657 (October 9, 1975). More recently, in a July 18, 1979 Memorandum asking the Advisory Committee on Construction Safety and Health to study the problem, Assistant Secretary of Labor Dr. Eula Bingham expressed concern that OSHA's "health standards . . . have been focused primarily on general industry," and, as a result "of the mobile and transient nature of their industry, construction employers and employees have had difficulty in complying with these standards."

Accordingly, both government and industry have begun to examine alternative regulatory strategies which achieve good health protection for construction workers without imposing fixed-site requirements such as engineering controls, exposure monitoring, medical surveillance, regulated areas, hygiene facilities, and other provisions which are frequently impracticable in non-fixed operations. In addition to the Construction Advisory Committee study, OSHA recently appointed a Special Assistant for Construction Affairs and, on June 7, 1979, established a Task Force on Construction. All of these steps are designed to provide OSHA with guidance on how to resolve the problems of regulating health hazards in the construction industry.

Industry's efforts have focused on alternative methods for protecting worker health. Attention has been directed toward the development of products and work practices which eliminate the need for the often cumbersome provisions of the customary OSHA health standard. In the asbestos industry, for example, construction materials which are capable of producing excessive exposures increasingly are being withdrawn from the market. In addition, simple work practices which minimize occupational asbestos exposure have been and are being developed and widely disseminated. (See Appendix.)

The Recommended Standard for Occupational Asbestos Exposure in Construction and Other Non-Fixed Work Operations

proposed herein is the logical outgrowth of these efforts. In brief, the Recommended Standard establishes a classification scheme designed to provide a series of economic and regulatory incentives for the development of work practices and product formulations which will provide good health protection for workers without imposing the often impractical features of the typical fixed-site OSHA standard. More specifically, the Recommended Standard classifies products into three categories (called "Category A," "Category B," and "Category C" Products) according to their potential asbestos exposure. See pp. 14-17, below. Different regulatory requirements would apply to each category, with successively more stringent requirements imposed for products presenting increasing levels of risks. See pp. 20-24, below.

The purpose of this product classification program is to encourage the development of safer products and work practices which eliminate the need for the fixed-site requirements of the current standard, such as monitoring and medical surveillance. See pp. 29-30, below. The Recommended Standard includes provisions for validation by fully qualified testing laboratories to ensure that validated work practices and product formulations are effective in protecting workers. See pp. 17-20, below. At the same time, OSHA's enforcement burden would be lightened considerably. In many cases, an inspector's job would be done once he determined that proper products or work practices are being used. In addition,

OSHA could conduct occasional monitoring as an empirical check on the effectiveness of validated products and work practices. See pp. 30-31, below.

In short, the alternative recommended herein will serve OSHA's health protection goals for the construction industry far better than the customary OSHA health standard. In practical effect, the current OSHA approach often leaves construction industry employers no choice except to abandon the use of essential or highly useful construction materials. By contrast, the Recommended Standard encourages the development of cost-effective products and work practices which both protect worker health and meet the practical needs of the construction industry and the economy as a whole.

II. THE NEED FOR A REGULATORY STRATEGY WHICH MORE CLOSELY REFLECTS THE EVERYDAY REALITIES OF CONSTRUCTION AND OTHER NON-FIXED WORKPLACES

The characteristics of employment in the construction industry present unique occupational health and industrial hygiene problems which plainly call for separate regulatory treatment. Employees work in a continuously changing environment, moving from one temporary worksite to another. Each worksite is unique, both because the outdoor nature of much of the work results in exposure patterns that can vary widely with changing weather conditions, and because each temporary worksite involves the use of different materials and processes over differing lengths of time.

As a result, occupational exposure to most toxic substances in construction work is highly variable. Moreover, because the duration of most tasks construction workers perform is limited, exposures are intermittent, brief and, for many substances, very low on the average. Asbestos dust is an example of such a substance, as the findings of a draft technological and economic feasibility study recently released by OSHA demonstrate:

Products containing asbestos are not used consistently [in construction work]. Individual workers may work with a product containing asbestos only very occasionally, although some may do so almost continuously. Thus, the total population exposed over time may be much larger than the population at risk at a moment in time, and average annual and cumulative exposure may be quite low.^{1/}

Apart from the nature of construction work itself, the economic structure of the construction industry suggests that customary occupational health and industrial hygiene measures are not appropriate. The industry is characterized by a predominance of small firms and the absence of stable employer-employee relationships. Over 70 percent of construction industry employers are proprietorships averaging

^{1/} Research Triangle Institute, Asbestos Dust: Technological Feasibility Assessment and Economic Impact Analysis of the Proposed Federal Occupational Standard p. II-35 (dated September 1978 and released December 1979) (hereinafter referred to as the "RTI Report").

one to four employees.^{2/} These firms are highly transient. Their number fluctuates widely according to seasonal variations and other short-term shifts in demand. Thus, firms are frequently formed to undertake specific projects and then disbanded.

As might be expected, the workforce is also highly transient and temporary, with turnover rates as high as 300 to 600 percent per year depending on the job or craft involved. Casual hiring and severance practices (i.e., "walk-on, walk-off") are common. Thus, individual workers may, over a working life, be employed by a very large number of firms.^{3/}

The typical OSHA health standard is simply not designed to accommodate the type of employment involved in the construction industry. Requirements for engineering controls, monitoring, medical surveillance, regulated areas and hygiene facilities can effectively protect worker health only in manufacturing or other "general industry" jobs involving stable employment relationships and regular assignment to fixed-site operations involving repetitive tasks. Yet, nearly every fixed-site health standard thus far promulgated

^{2/} RTI Report p. II-35.

^{3/} Statement of Fred Graham, National Constructors Association (NCA), OSHA Docket H-90 (Cancer Policy), Ex. 125 at 2; RTI Report p. II-36.

by OSHA under Section 6(b) of the Occupational Safety and Health Act applies to construction workplaces. 44 Fed. Reg. 8706-8805 (February 9, 1979). The current asbestos standard provides a good example of why a new regulatory strategy for construction and other non-fixed workplaces is needed.

For example, the current asbestos standard requires construction industry employers to conduct personal and environmental ("area") monitoring which must be "of such frequency and pattern to represent with reasonable accuracy the levels of exposure of employees." 29 C.F.R. § 1910.1001 (f)(2),(3). The nature of construction work makes this requirement for "representative" exposure monitoring a virtually meaningless (albeit very expensive) exercise.

As pointed out above, only a few of the remarkable variety of tasks performed by construction workers involve asbestos-containing products, and a worker's asbestos exposure on any single day will obviously depend on what portion of that day was spent doing asbestos-related-tasks. Moreover, each asbestos-related-task presents a different potential for exposure to asbestos fibers. Exposure levels will vary depending on the duration of the work, the work procedures followed by the particular employee, the tools used, the fiber-release characteristics of the asbestos-containing product, weather conditions, and other factors.^{4/} As a

^{4/} See, e.g., Statement of Lt. Col. David Smith on behalf
(Footnote 4 continued on next page.)

result, a worker's exposure on any given day will not be "representative" of his exposure on any other day, nor will it be "representative" of any other worker's exposure.

Consequently, the current OSHA provision for monitoring at "such frequency and pattern as to represent with reasonable accuracy the levels of exposure of employees" imposes a considerable burden. It could be read to require continuous monitoring of all of the millions of workers who may be "exposed" (even though briefly and intermittently) to detectable levels of asbestos fibers.^{5/} But given the uniqueness of each operation, repetitive monitoring provides information of limited value in determining whether an exposure limitation is being satisfied throughout all operations. And even if the resources were available, the five-to-six week period needed for laboratory analysis exceeds the life of many construction operations involving asbestos.

(Footnote 4 continued from previous page.)

of the Department of Defense, Docket H-004 (Lead), Ex. 130; Statement of C. R. Mattson (NCA), Docket H-004 (Lead), Ex. 98; Statement of Harry Taylor on behalf of the Council of Construction Employers, Docket H-004 (Lead), Ex. 64; Statement of I. J. Meyerson on behalf of Boeing Aerospace Company, Docket H-004 (Lead), Ex. 30.

^{5/} In 1975, OSHA suggested that three to five million construction and shipbuilding workers may be exposed to asbestos dust. 40 Fed. Reg. 47653 (October 9, 1975). Table II-3 of the RTI Report (p. II-27) estimates the number to be about 2.3 million.

The current asbestos standard also requires construction employers to provide preplacement, annual and termination medical examinations involving a battery of tests, including diagnostic x-rays and pulmonary function tests, to every worker exposed to virtually any detectable level of airborne asbestos dust. 29 C.F.R. § 1910.1001(j); OSHA Program Directive 300-16 (October 11, 1978). Like the monitoring requirement, this medical surveillance provision does little to protect the health of construction industry workers.

Medical surveillance creates health and economic risks to the worker which outweigh any health benefits that might be achieved. The rapid turnover of both employees and employers creates a significant potential for unnecessary repeat examinations and over-exposure to diagnostic x-rays.^{6/} As Dr. Irving Selikoff testified before the Subgroup, "doing a chest x-ray on 19 year old kids every year is not only a waste of good x-rays, but I think dangerous for those who are taking them."^{7/} In addition, the results of the examination

^{6/} See "Health Standards Pose Big Problems for Industry," Engineering News-Record, October 12, 1978. Excessive x-ray exposure creates an increased risk of leukemia and many other forms of cancer. See, e.g., EPA, Addition of Radionuclides to the List of Hazardous Air Pollutants, 44 Fed. Reg. 76738 (December 27, 1979).

^{7/} Testimony of Dr. Irving Selikoff before the Subgroup on Health Standards of the Construction Advisory Committee, Tr. 45 (September 24, 1979).

may discriminate against individual workers by making them unemployable even without any actual disability.^{8/}

In light of these health and economic risks, the wisdom of requiring medical examinations for all workers who may be exposed to any detectable level of asbestos dust is questionable. Although many construction workers may, at one time or another, be exposed to detectable asbestos levels, few are exposed more than intermittently and briefly. Consequently, a reasonable cut-off is needed to screen from the medical surveillance program those workers whose exposure is insufficient to warrant medical surveillance (with its own attendant risks).

Other components of the typical OSHA health standard are equally inappropriate in light of the realities of construction work. For example, the concept of fixed, limited-access "regulated areas" is largely meaningless in construction worksites. As the National Constructors Association points out, "work is performed in a continuously changing environment," and "personnel are constantly being called upon to perform work in irregularly occupied areas on a transitory basis."^{9/}

^{8/} Testimony of Dr. Clark Cooper before the Subgroup on Health Standards of the Construction Advisory Committee, Tr. 30-31 (November 26, 1979).

^{9/} Statement of Fred Graham, OSHA Docket H-60 (Cancer Policy), Ex. 125 at 7, 9.

Similarly "hygiene facilities" such as change rooms, shower rooms, or lunch rooms are impractical for many construction employers. Most construction sites have no supply of water or the buildings necessary to house these facilities. Further, the cost of procuring mobile, self-contained facilities is frequently prohibitive, particularly for small-scale construction projects such as residential dwellings or small office buildings.

There is no reason to believe that many of the small, transitory employers in the construction industry are likely to have the personnel or financial resources to meet any of these fixed-site requirements. Indeed, the National Constructors Association has stressed that the routine adoption of such requirements would "place an intolerable economic and logistical strain on the construction industry -- particularly small contractors." NCA added that "the costs are so extreme as to threaten the continued existence of many small and medium size construction companies throughout the nation, without a clear demonstration of the necessity for such rigid health controls."^{10/}

In sum, many provisions of the typical OSHA health standard -- concededly designed for fixed-site employment in "general industry" -- are misplaced when applied to construction and other non-fixed workplaces. The unique

^{10/} Id. at 4, 5.

characteristics of these workplaces require a fresh approach which both provides good health protection for workers and is feasible, cost-effective, enforceable, and likely to encourage the development of safer products and work practices. The next section shows, using asbestos as an example, that such a regulatory strategy can indeed be developed for construction and other non-fixed workplaces.

III. EXPLANATION AND ADVANTAGES OF THE RECOMMENDED STANDARD

Occupational health standards should serve a number of different objectives. First, they should be enforceable regulations which adequately protect workers from occupational health hazards. Second, they should impose practical requirements which promote voluntary compliance, avoid unnecessary burdens on employers and the public, and channel available occupational health resources to areas where those resources will achieve the greatest health gains for workers. And third, they should encourage the private sector to develop safer products and work practices which efficiently satisfy the practical and economic needs of the construction industry and the general economy.

The Recommended Standard would achieve these objectives by establishing a product classification program, based upon qualified laboratory tests, which would rank asbestos-containing products used in construction operations according to their potential for releasing airborne asbestos fibers in

excess of the permissible exposure limits. The Standard would impose regulatory requirements commensurate with the exposure risk presented by each product category, applying more stringent requirements for higher-risk products, including full compliance with the existing standard for products presenting the greatest risk of exposure above permissible levels.

A. Explanation of the Recommended Standard

1. Scope and application

The Recommended Standard would apply to "construction work and other non-fixed places of employment where asbestos or products containing asbestos are processed or used."

Rec. Std. ¶ (a). The definition of the term "construction work" in Paragraph (b)(8) is identical to OSHA's definition of the term under its General Industry Standards. 29 C.F.R. § 1910.12.

The Standard defines the term "non-fixed work operation" to refer to "jobs which do not involve regular assignment to a permanent work location or set of locations."

Rec. Std. ¶ (b)(9). The purpose of this provision is to include highly mobile non-construction operations such as oil well drilling, where asbestos exposures (from the use of drilling mud additives containing asbestos) may occur under circumstances similar to construction activities.

Lastly, the Recommended Standard contains a provision which clearly separates the coverage of the current OSHA asbestos standard from the proposed new construction standard. The current OSHA standard does not contain any specification of scope and application, but the provisions of the standard make clear that it applies to any workplace where there is occupational exposure to asbestos. Accordingly, the Recommended Standard adds to the current standard a new paragraph which excludes construction and other non-fixed workplaces which would be covered by the proposed new standard.

2. Classification of products

The categorization of asbestos-containing products used in construction operations according to their fiber-release potential is the foundation of the recommended approach. The proposal would establish three classifications (called "Category A," "Category B" and "Category C" Products) which are defined according to a product's capacity, under reasonably foreseeable conditions of processing or use in construction and other non-fixed operations, for releasing airborne asbestos fibers in excess of the permissible exposure limits. As discussed later, different regulatory requirements would apply to each category, both to reflect the degree of risk associated with each type of operation, and to establish

incentives for the development and use of safer products and work practices.

A "Category A Product" is defined in Paragraph (b)(1) as a "product which, based on objective data, including but not necessarily limited to an exposure study conducted by a Certified Testing Laboratory, does not result in occupational exposure to airborne concentrations of asbestos fibers in excess of the permissible exposure limits under any reasonably foreseeable conditions of processing or use." Category A is the safest product classification and will generally include products in which asbestos fibers are coated, bound or enclosed by other materials in such a way that they will not be released in significant quantities in any reasonably foreseeable construction industry use. As discussed in the Appendix, these products are likely to include mastics, mechanical packings, oil seals, compressed gaskets, sealants and caulks, and electrical insulating paper.

A "Category B Product" is defined in Paragraph (b)(2) as a "product which, based on objective data, including but not necessarily limited to an exposure study conducted by a Certified Testing Laboratory, does not, under any reasonably foreseeable conditions of processing or use, result in occupational exposure to airborne concentrations of asbestos fibers in excess of the permissible exposure limits when a specified fabrication, installation or removal method is

used." In effect, Category B Products are capable of producing airborne asbestos fiber concentrations in excess of the permissible exposure limits under some reasonably foreseeable construction uses, but will not do so if the correct work procedures, tools or other safeguards are employed in those situations.

Obviously, some regulatory controls must be applied to Category B Products to ensure that they are used in a way that prevents the release of excessive concentrations of asbestos fibers. Nevertheless, if properly classified, Category B Products do not require the full panoply of typical fixed-site requirements. So long as the use of proper work practices, tools or other safeguards is ensured, additional requirements are unnecessary or redundant. As discussed in the Appendix, AIA/NA, AACPP and their member companies have developed data showing that work practices for two asbestos-containing products -- asbestos-cement pipe and asbestos-cement sheet can be validated under Category B of the Recommended Standard.

The last classification -- "Category C Products" -- covers products which do not fall into either of the two preceding categories. Rec. Std. ¶ (b)(3). Because they possess neither the innate physical characteristics nor the validated work practice controls which are needed to ensure that the permissible exposure levels are met, Category C Products present the greatest potential for significant

asbestos exposures, and accordingly require the most stringent regulatory controls.

3. Validation

For any product classification program to be successful, it is, of course, necessary to provide adequate assurances that products will properly be classified. The Recommended Standard employs two devices for achieving this goal:

- (i) validation by qualified testing laboratories, and
- (ii) empirical field confirmation by OSHA in connection with workplace inspections.

In order to classify an asbestos-containing product within Category A or B, there must exist "objective data, including but not necessarily limited to an exposure study conducted by a Certified Testing Laboratory." Rec. Std. ¶¶ (b)(1) & (2). Paragraph (b)(6) defines a "Certified Testing Laboratory" as "a laboratory accredited by the American Industrial Hygiene Association [AIHA] as qualified to test for airborne concentrations of asbestos fibers" using the method prescribed in the current OSHA asbestos standard. The use of laboratories which are accredited by AIHA provides an important safeguard against invalid or unsupported product classifications.

The term "exposure study" is defined as "a study which shows, with reasonable accuracy, the concentrations of airborne asbestos fibers to which employees may reasonably be

expected to be exposed under specified conditions of processing or use of an asbestos-containing product." Rec. Std. ¶ (b)(7). The "reasonable accuracy" provision is identical to the current OSHA monitoring requirement (quoted at p. 7, above) and is intended to require that an "exposure study" be designed in a way that provides the same degree of accuracy as under the existing monitoring provisions.

While an "exposure study" must be conducted, it is not necessarily the sole basis for classifying a product. As discussed above (pp. 7-8), exposure testing which identifies exposure levels associated with all "reasonably foreseeable" uses of a product "with reasonable accuracy" might require in some cases a very large number of measurements to take account of the infinite variety of work procedures, product formulations, weather conditions, and other factors which affect exposures. Accordingly, the Recommended Standard permits the use of "objective data" in addition to data from an exposure study to support a classification. Such "objective data" might, for example, identify "worst case" operations which, once tested and found to result in exposures below permissible levels, would provide a sufficient basis for the classification. Thus, the "objective data" provision will permit limited testing which provides a "reasonably accurate" basis for concluding that permissible levels will not be exceeded under any reasonably foreseeable conditions.

For much the same reason, the Recommended Standard would not necessarily require that "exposure studies" be conducted for each individual asbestos-containing product used in construction. Entire categories of products might be validated by a single exposure study if objective data shows a sufficient degree of physical similarity among the products, or if testing is done on the product which presents the greatest exposure capacity. For example, all "asbestos-cement pipe" products might be classified based on a single exposure study of one of the products, if "objective data" shows that the specific product studied has the greatest capacity to release airborne asbestos fibers.

The Recommended Standard makes clear that a construction industry employer can treat a specific product as falling within Category A or B only if the employer "reasonably relies on objective data, including but not necessarily limited to an exposure study conducted by a Certified Testing Laboratory." Rec. Std. ¶¶ (c)(1) & (d)(1). Thus, in order to claim the exemptions provided by the Recommended Standard, a construction employer must have an exposure study and, where appropriate, objective data which support a conclusion that the specific product (together with any associated work practices) the employer plans to use will not result in a violation of the permissible exposure limits.

The Recommended Standard does not give Certified Testing Laboratories the final word on product classification.

Instead, it requires "reasonable reliance" by employers on the data supplied by the validating laboratory. Rec. Std. ¶¶ (c)(1) & (d)(1). The term "reasonable reliance" is not specifically defined, but rather is left open for case-by-case determination in enforcement proceedings. Certainly the reputation of the validating laboratory, the employer's previous experience with the laboratory, the facial completeness of the data and the laboratory's specific conclusions would be relevant considerations.

Another key factor in specific cases would be any findings from previous OSHA inspections of an operation. For example, if an OSHA inspection showed that the applicable exposure limits were exceeded during an operation involving a Category A Product, or during an operation involving a Category B Product where the proper work practices were followed, an employer's ability to continue to rely "reasonably" on the data supplied by the validating laboratory would be placed in doubt, depending on the accuracy and extent of data provided by OSHA in each case. This feature of the Recommended Standard gives OSHA a vehicle for monitoring and verifying the correctness of classifications.

4. Regulatory requirements

The Recommended Standard imposes different regulatory controls on each product category, and tailors the applicable

controls to the degree of the exposure hazard presented by each type of product or operation.

Category A Products are effectively exempt from the existing standard by Paragraph (c).^{11/} Since Category A Products present little or no risk of excessive exposure, no new regulatory requirements are imposed. Moreover, as discussed in greater detail below, the absence of regulatory controls on Category A Products creates a strong incentive for the development and use of products which will not lead to significant exposure.

For Category B Products, the Recommended Standard requires employers to comply with the "fabrication, installation or removal methods" which qualify the products under Category B. Rec. Std. ¶ (d)(1). The expression "fabrication, installation and removal methods" is defined in Paragraph (b)(4) to include any combination of engineering controls, work practices or administrative controls, house-keeping, and respiratory protection. While work practice controls are expected to be the predominant mode of compliance because of the special features of the construction industry discussed above (pp. 4-6), the purpose of the definition is to permit the use of tools with local exhaust

^{11/} One minor exception is provided in Paragraph (c)(2), which leaves the "emergency" requirements of the existing standard in effect for Category A Products. See also the discussion of Paragraph (f) at p. 24, below.

ventilation or work scheduling as ancillary protective measures. The use of respirators as part of a Category B classification is not permitted under the Recommended Standard unless no other control method is feasible for a given operation.

Employers claiming exemptions for Category B Products must, of course, take all practicable steps to ensure that validated work practices and other protective measures are, in fact, used. Rec. Std. ¶ (d)(1). Several additional requirements are imposed to ensure the use and effectiveness of the validated work practices and other protective measures. First, the requirements of the current OSHA standard governing the use of respirators in emergencies are made applicable to workplaces using Category B Products. Rec. Std. ¶ (d)(2). Second, manufacturers of Category B Products are required to include a product label warning that validated work practices, tools or other measures should be used. Rec. Std. ¶ (d)(3). Third, the employers are required to ensure that employees using Category B Products are "specifically instructed concerning the proper use of [the] fabrication, installation or removal methods" which were validated as part of the Category B classification. Rec. Std. ¶ (d)(4). Because of rapid employee turnover, there is no requirement for annual training. Moreover, it is important to note that many Category B Products will not require the use of a "fabrication, installation or removal

method" for all operations in which they are used. Thus, the training provisions of Paragraph (d)(4) apply only to those "operations where such fabrication, installation, or removal methods must be used." Rec. Std. ¶ (d)(4).

For Category C Products, which, by definition, pose the greatest potential for exposure, the current OSHA asbestos standard would apply in full. Rec. Std. ¶ (e). As discussed above (pp. 16-17), Category C Products have neither the structural product characteristics nor the validated work practice controls needed to protect workers against excessive exposures. While many components of the typical OSHA fixed-site health standard (such as the current asbestos standard) are generally inappropriate for construction and other non-fixed workplaces, those provisions should nevertheless be applied in the case of Category C Products to provide a strong incentive for developing safer products and work practices.

It is important to note that the regulatory status of Category A and B Products is expressed in the form of exemptions from the current standard. As a result, if a construction employer cannot claim one of the exemptions, the entire existing standard could be enforced against him. The threat of citations and penalties for violating the many individual requirements of the existing standard will provide a powerful incentive for employers to make doubly sure that the criteria for Category A or B classifications are met. In addition,

in the case of Category B Products, employers are subject to citation for failing to follow the validated work practices and training requirements, even if the classification criteria have been satisfied.

There is one situation where the exemptions provided for Category A and B Products do not fully apply. As discussed in greater detail in the Appendix (pp. 3b-4b), construction employees working (e.g., making repairs) in a facility which manufactures or fabricates asbestos-containing products will generally be protected by the current standard, which applies to the owner of that facility. However, construction workers could be exposed to excessive concentrations of asbestos dust in an emergency or from dust which has accumulated in normally inaccessible places such as on pipes and ductwork. Accordingly, Paragraph (f) makes the "emergency" and "housekeeping" provisions of the current standard applicable in those special circumstances.

Lastly, Paragraph (g) requires construction employers to make available, at the request of OSHA, NIOSH or its employees, any objective data and exposure studies on which it relies, together with materials relating to the training of employees in the use of validated work practices. This provision will not only assist OSHA's enforcement efforts, but in addition it allows for external review of validating studies by NIOSH, workers and others.

B. Advantages Over OSHA's Typical
Fixed-Site Health Standard

The Recommended Standard for Asbestos Exposure in Construction and other Non-fixed Work Operations has a number of distinct advantages over the current OSHA regulation. First, it imposes practical requirements which nevertheless provide ample assurances for worker protection. Second, it creates incentives for the development of safer products and work practices without sacrificing the economic and practical advantages of asbestos-containing products for the construction industry and the economy as a whole. And third, the Recommended Standard can more efficiently be enforced than the current OSHA standard.

1. Worker protection

The Recommended Standard, to be sure, departs significantly from the provisions of the traditional OSHA health standard. Nevertheless, as demonstrated above (pp. 4-12), these fixed-site requirements contribute little to worker health and are often impractical in construction and other non-fixed operations. Even if it had unlimited enforcement resources, OSHA could not hope to achieve widespread compliance with these provisions, and construction employers would be left with the "Hobson's choice" of risking noncompliance penalties or abandoning highly useful or, in some instances, essential products.

OSHA itself has, on occasion, limited or modified its traditional regulatory approach in an effort to avoid standards which impose sweeping requirements without any significant or commensurate health gain. OSHA's current labeling requirement for asbestos-containing products, for example, provides that "no label is required where asbestos fibers have been modified by a bonding agent, coating, binder, or other material so that during any reasonably foreseeable use, . . . no airborne concentrations of asbestos fibers in excess of the exposure limits . . . will be released." The waste disposal requirement of OSHA's current asbestos standard contains an almost identical exemption. 29 C.F.R. § 1910.1001(g)(2)(i) and (h)(2). In effect, OSHA has recognized that some asbestos-containing materials do not pose an exposure threat which is significant enough to justify full-scale regulatory controls.

Another example of an effort to prevent unduly broad application of monitoring, medical surveillance and other typical OSHA requirements is OSHA's Inorganic Arsenic Standard, which excludes workplaces where inorganic arsenic is present in only small amounts. OSHA justified an exemption in that case as follows:

[A]rsenic is a naturally occurring material and is present in small amounts in many substances. It is therefore inappropriate to cover situations where very low levels of arsenic may be present in substances or products in the workplace, but where they are handled in such a way that the possibility of airborne exposure is minimal. 43 Fed. Reg. 19612 (May 5, 1978).

Similarly, OSHA's Cotton Dust Standard contains a series of exemptions where application of the standard would achieve little at great cost. Specifically, the Cotton Dust Standard exempts: (i) maritime workers, because the "limited duration of exposure makes it unlikely that cotton dust exposure is significant for an appreciable number of the workers handling water borne shipments of cotton"; (ii) workers handling "washed cotton," because of the "effectiveness of the washing process in significantly reducing or eliminating the biological effects of cotton dust"; and (iii) harvesting of cotton, because "it is a distinctively farming operation and presents different exposure environments and possibilities of control." 43 Fed. Reg. 27381-82 (June 23, 1978).

OSHA took a similar approach in formulating its Benzene Standard. There, it exempted gasoline stations and other operations where the standard would have a sweeping impact, but where exposures are not likely to exceed permissible limits. 29 C.F.R. § 1910.1028(a)(2); 43 Fed. Reg. 27962 (June 27, 1978).

OSHA's Acrylonitrile (AN) Standard, which more closely resembles the alternative standard recommended for asbestos exposure in the construction industry, also reflects an effort to adapt the traditional regulatory approach to unique circumstances. The AN standard imposes the traditional fixed-site requirements on manufacturers of products

containing AN, but exempts downstream processors and fabricators of such products where "objective data is reasonably relied upon" to show that a designated action level is not exceeded. 29 C.F.R. § 1910.1045(a)(2)(ii). In adopting this and other exemptions from the overall AN standard, OSHA "recognized that the potential for exposure to AN in the workplace extends to a multitude of workplaces, including many small fabricators, extruders, and other downstream processors of materials containing or made from AN," and that "extending the AN standard that far would be burdensome to both industry and OSHA, and would not be reasonable in light of the degree of exposure involved." 43 Fed. Reg. 45776 (October 3, 1978).

Significantly, the Recommended Standard goes beyond the AN standard in protecting worker health. First, it requires that product and work practice testing be performed only by fully qualified testing laboratories. Second, it requires objective data, including exposure studies, which provide a "reasonable assurance" that the permissible exposure limits will not be exceeded. This latter point is especially important in the case of asbestos, where the OSHA technique for measuring airborne asbestos concentrations is subject to a margin of uncertainty so great that "[a]n actual airborne fiber concentration of 0.5 fibers/cc will routinely produce sample counts of 2.0 fibers/cc or more."^{12/} Consequently,

^{12/} Comments of Johns-Manville, OSHA Docket H-033 (Asbestos), Ex. 3-185 at ex. D, p. 42.

the "reasonable accuracy" requirement will, in practice, not be met unless the products and work practices being tested routinely produce measurements far below the permissible exposure limits, adding a significant extra margin of worker safety.

2. Incentives for the development and use of safer products and work practices

Apart from providing superior health protection for workers without the cumbersome fixed-site features of the current standard, the Recommended Standard creates strong incentives for the development of safer products and work practices. Under the current standard, construction employers cannot legally avoid fixed-site requirements no matter how safe the asbestos-containing products or work practices which they employ. Thus, they must either ignore the standard to the detriment of employees, or they must stop using extremely valuable construction materials, to the detriment of the economy.

Under the Recommended Standard, the threat that the current standard might be enforced in full provides a powerful incentive for the development and use of products or work practices which qualify for Category A or B classification. As a result, two critical objectives would be advanced. First, worker health would be protected through the use of products and work practices which present no serious risk of excessive asbestos exposure. Second, the

current incentive for across-the-board substitution of inferior non-asbestos-containing products of unknown potential hazard would be eliminated and replaced with a scheme which encourages the use of the best construction materials which do not threaten the health of workers.

3. Enforceability

The third principal advantage of the recommended approach is that it will ease the tremendous enforcement burden OSHA faces in policing the millions of workers potentially exposed to asbestos dust in hundreds of thousands of construction sites throughout the nation. Under the Recommended Standard, in a large majority of cases, OSHA inspectors may have to do nothing more than determine whether the proper products and work practices are being used. This task is much simpler and less time-consuming and expensive than under the current standard, where exposure monitoring may have to be conducted for each operation and employer medical, industrial hygiene and other files may have to be searched and reviewed.

Instead of endlessly monitoring individual construction operations to determine whether the permissible exposure limits are being met in each unique case, the Recommended Standard allows OSHA to focus its enforcement activities on identifying improper product classifications. As discussed above, once sampling results from OSHA inspections indicate that a product may be improperly classified, construction

employers and upstream manufacturers of asbestos-containing products throughout the nation will have a powerful incentive to develop substitute products or work practices which ensure that exposure limitations are met.

IV. CONCLUSION

There is a clear need for a new strategy to control health hazards in construction and other non-fixed work operations. The current OSHA approach, which imposes on these operations provisions for endless, repeated monitoring and medical surveillance as well as other requirements designed for fixed-site jobs in manufacturing industries, is simply not feasible. Nor do many of the requirements of the customary OSHA standard contribute appreciably to the health of construction workers.

The better approach is to substitute a regulatory scheme that strongly encourages the use of products and work practices which protect workers against excessive exposures without imposing infeasible fixed-site requirements such as monitoring and medical surveillance. As this paper has illustrated in the particular case of asbestos, such an approach provides fully adequate health protection for workers, establishes continuing incentives for the development and use of safer products and work practices, and considerably eases OSHA's enormous enforcement burden. The

proposed standard recommended herein plainly meets these objectives and should therefore be carefully considered by OSHA and the Construction Advisory Committee in connection with their efforts to develop an effective occupational health strategy for construction and other non-fixed work operations.

The Asbestos Information
Association of North
America

and

The Association of Asbestos
Cement Pipe Producers

The issue here is not whether the "right" to freedom of the press conferred by the First Amendment to the Constitution overrides the defendant's "right" to a fair trial conferred by other amendments to the Constitution; it is instead whether any provision in the Constitution may fairly be read to prohibit what the trial judge in the Virginia state court system did in this case. Being unable to find any such prohibition in the First, Sixth, Ninth, or any other amendments to the United States Constitution, or in the Constitution itself, I dissent.



INDUSTRIAL UNION DEPARTMENT,
AFL-CIO, Petitioner,

v.

AMERICAN PETROLEUM
INSTITUTE et al.

Ray MARSHALL, Secretary of
Labor, Petitioner,

v.

AMERICAN PETROLEUM
INSTITUTE et al.

Nos. 78-911, 78-1036.

Argued Oct. 10, 1979.

Decided July 2, 1980.

Producers of benzene filed petition for review of a new health standard promulgated by the Occupational Safety and Health Administration limiting occupational exposure to benzene. The Court of Appeals, Fifth Circuit, 581 F.2d 493, held that standard invalid, and certiorari was granted. The Supreme Court, per Mr. Justice Stevens with three Justices joining and one Justice concurring in the judgment, held that the subject standard, reducing the permissible exposure limit on airborne concen-

trations of benzene from the consensus standard of ten parts benzene per million parts of air to one part per million, was unenforceable since the standard was not supported by appropriate findings; OSHA's rationale for lowering the permissible exposure limit from 10 ppm to 1 ppm was based not on any finding that leukemia has ever been caused by exposure to 10 ppm of benzene and that it will not be caused by exposure to 1 ppm, but rather on a series of assumptions indicating that some leukemia might result from exposure to 10 ppm and that the number of cases might be reduced by lowering the exposure level to 1 ppm.

Judgment affirmed.

Mr. Chief Justice Burger filed a concurring opinion.

Mr. Justice Powell filed an opinion concurring in part and in the judgment.

Mr. Justice Rehnquist filed an opinion concurring in the judgment.

Mr. Justice Marshall, joined by Mr. Justice Brennan, Mr. Justice White and Mr. Justice Blackmun, filed a dissenting opinion.

1. Labor Relations ⇐27

Provision of the Occupational Safety and Health Act defining an "occupational safety and health standard" requires the Secretary of Labor to find, as a threshold matter to the promulgation of a standard concerning a toxic substance, that the substance in question poses a significant health risk in the workplace, and that a new, lower standard is therefore "reasonably necessary or appropriate to provide safe or healthful employment and places of employment." (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.) Occupational Safety and Health Act of 1970; § 3(8), 29 U.S.C.A. § 652(8).

2. Labor Relations ⇐9.5

Occupational safety and health standard promulgated by the Secretary of Labor pursuant to the Occupational Safety

and Health Act, reducing exposure limit on airborne benzene from the consensus standard of ten parts benzene per million parts of air to one part per million, was not supported by appropriate findings; the Occupational Safety and Health Administration's rationale for lowering the permissible exposure limit from 10 ppm to 1 ppm was based not on any finding that leukemia has ever been caused by exposure to 10 ppm of benzene and that it will not be caused by exposure to 1 ppm, but rather on a series of assumptions indicating that some leukemia might result from exposure to 10 ppm and that the number of cases must be reduced by lowering the exposure level to 1 ppm. (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.) Occupational Safety and Health Act of 1970, §§ 3(8), 652(8), 655(b)(5).

3. Administrative Law ⇐753

Validity of an agency action must be judged on the stated reasons for maintenance. (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.)

4. Labor Relations ⇐

Provision of the Occupational Safety and Health Act defining an "occupational safety and health standard" requires the Secretary of Labor to find, as a threshold matter to the promulgation of a standard concerning a toxic substance, that the substance in question poses a significant health risk in the workplace, and that a new, lower standard is therefore "reasonably necessary or appropriate to provide safe or healthful employment and places of employment." (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.) Occupational Safety and Health Act of 1970; § 3(8), 29 U.S.C.A. § 652(8).

and Health Act, reducing the permissible exposure limit on airborne concentrations of benzene from the consensus standard of ten parts benzene per million parts of air to one part per million, was unenforceable since the standard was not supported by appropriate findings; the Occupational Safety and Health Administration's rationale for lowering the permissible exposure limit from 10 ppm to 1 ppm was based not on any finding that leukemia has ever been caused by exposure to 10 ppm of benzene and that it will not be caused by exposure to 1 ppm, but rather on a series of assumptions indicating that some leukemia might result from exposure to 10 ppm and that the number of cases must be reduced by lowering the exposure level to 1 ppm. (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.) Occupational Safety and Health Act of 1970, §§ 3(8), 6(b)(5), 29 U.S.C.A. §§ 652(8), 655(b)(5).

3. Administrative Law and Procedure ⇐ 753

Validity of an agency's determination must be judged on the basis of the agency's stated reasons for making that determination. (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.)

4. Labor Relations ⇐ 27

Provision of the Occupational Safety and Health Act defining an occupational safety and health standard as a standard "reasonably necessary and appropriate to provide safe and healthful employment" does not apply to all permanent standards promulgated under the Act, and requires the Secretary of Labor, before issuing any standard, to determine that it is reasonably necessary and appropriate to remedy a significant risk of material health impairment; only after the Secretary has made the threshold determination that such risk exists with respect to a toxic substance would it be necessary to decide whether the Act requires him to select the most protective standard he can consistent with economic and technological feasibility, or whether the

benefits of the regulation must be commensurate with the costs of its implementation. (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.) Occupational Safety and Health Act of 1970, §§ 3(8), 6(b)(5), 29 U.S.C.A. §§ 652(8), 655(b)(5).

5. Labor Relations ⇐ 9.5

Occupational Safety and Health Act was not designed to require employers to provide absolutely risk-free workplaces whenever it is technologically feasible to do so, so long as the cost is not great enough to destroy the entire industry; rather, both the language and structure of the Act, as well as its legislative history, indicate that it was intended to require the elimination, as far as feasible, of significant risks of harm. (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.) Occupational Safety and Health Act of 1970, § 2 et seq., 29 U.S.C.A. § 651 et seq.

6. Labor Relations ⇐ 9.5

By empowering the Secretary of Labor to promulgate standards that are "reasonably necessary or appropriate to provide safe or healthful employment and places of employment," the Occupational Safety and Health Act implies that, before promulgating any standard, the Secretary must make a finding that the workplaces in question are not safe; but "safe" is not the equivalent of "risk-free," and a workplace can hardly be considered "unsafe" unless it threatens the workers with a significant risk of harm. (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.) Occupational Safety and Health Act of 1970, §§ 2 et seq., 3(8), 6(b)(5), 29 U.S.C.A. §§ 651 et seq., 652(8), 655(b)(5).

7. Labor Relations ⇐ 27

Before the Secretary of Labor can promulgate any permanent health or safety standard under the Occupational Safety and Health Act, he must make a threshold finding that the place of employment is

unsafe in the sense that significant risks are present and can be eliminated or lessened by a change in practices; this requirement applies to permanent standards promulgated pursuant to the Act, as well as to other types of permanent standards, there being no reason why the Act's definition of a standard should not be deemed incorporated by reference into the provision directing the Secretary to "set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity." (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.) Occupational Safety and Health Act of 1970, §§ 3(8), 6(b)(5), 29 U.S.C.A. §§ 652(8), 655(b)(5).

8. Labor Relations — 27

Requiring the Secretary of Labor, before promulgating any permanent health or safety standard under the Occupational Safety and Health Act, to make a threshold finding of significant risk is consistent with the scope of his regulatory power under the Act to promulgate standards for "toxic chemicals" and "harmful physical agents"; furthermore, this interpretation is supported by other provisions of the Act, such as that which requires the Secretary, in determining the priority for establishing standards, to give due regard to the urgency of the need for mandatory safety and health standards for particular industries or workplaces, and that which requires the Secretary, when he substantially alters an existing consensus standard, to explain how the new rules will "better effectuate" the Act's purposes. (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.) Occupational Safety and Health Act of 1970, §§ 3(8), 6(b)(5), 8, (g), 29 U.S.C.A. §§ 652(8), 655(b)(5), (b)(5, 8), (g).

9. Labor Relations 9.5

Legislative history of the Occupational Safety and Health Act supports the conclusion that Congress was concerned not with absolute safety, but with the elimination of significant harm. (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.) Occupational Safety and Health Act of 1970, § 2 et seq., 29 U.S.C.A. § 651 et seq.

10. Labor Relations 9.5

Secretary of Labor, in promulgating a standard placing the most stringent limitation on exposure to benzene that is technologically and economically possible, relied on a special policy for carcinogens that imposed the burden on industry of proving the existence of a safe level of exposure to benzene; he thereby exceeded his threshold responsibility of establishing the need for more stringent standards and exceeded his power under the Occupational Safety and Health Act. (Per Mr. Justice Stevens, with three Justices joining and one Justice concurring in the judgment.) Occupational Safety and Health Act of 1970, §§ 2 et seq., 3(8), 6(b)(5), 29 U.S.C.A. §§ 651 et seq., 652(8), 655(b)(5).

Syllabus *

The Occupational Safety and Health Act of 1970 (Act) delegates broad authority to the Secretary of Labor (Secretary) to promulgate standards to ensure safe and healthful working conditions for the Nation's workers (the Occupational Safety and Health Administration (OSHA) being the agency responsible for carrying out this authority). Section 3(8) of the Act defines an "occupational safety and health standard" as a standard that is "reasonably necessary and appropriate to provide safe and healthful employment." Where toxic materials or harmful physical agents are concerned, a standard must also comply with § 6(b)(5), which directs the Secretary to "set the standard which most adequately assures, to the

the reader. See *United States v. Detroit Lumber Co.*, 200 U.S. 321, 337, 26 S.Ct. 282, 287, 50 L.Ed. 499.

*The syllabus constitutes no part of the opinion of the Court but has been prepared by the Reporter of Decisions for the convenience of

extent feasible available evidence suffer material functional impairment or harm. If it is determined that a carcinogen is in the position to be determined by him to set and technologically impair the viability. In this case, there is a carcinogen (a toxic substance) such as pesticides, and cancer of the respiratory promulgated permissible exposure concentrations of standard of parts of air (1) ing dermal contact ing benzene. the Court of invalid because unsupported by The court concluded its standard exceeded its standard cause it had no exposure limit appropriate to "employments" § 6(b)(5) did not discretion to create "absolute" regardless of

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Pp. 2858-2869.

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extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity." When the toxic material or harmful physical agent to be regulated is a carcinogen, the Secretary has taken the position that no safe exposure level can be determined and that § 6(b)(5) requires him to set an exposure limit at the lowest technologically feasible level that will not impair the viability of industries regulated. In this case, after having determined that there is a causal connection between benzene (a toxic substance used in manufacturing such products as motor fuels, solvents, detergents, and pesticides) and leukemia (a cancer of the white blood cells), the Secretary promulgated a standard reducing the permissible exposure limit on airborne concentrations of benzene from the consensus standard of 10 parts benzene per million parts of air (10 ppm) to 1 ppm, and prohibiting dermal contact with solutions containing benzene. On pre-enforcement review, the Court of Appeals held the standard invalid because it was based on findings unsupported by the administrative record. The court concluded that OSHA had exceeded its standard-setting authority because it had not been shown that the 1 ppm exposure limit was "reasonably necessary or appropriate to provide safe and healthful employment" as required by § 3(8), and that § 6(b)(5) did not give OSHA the unbridled discretion to adopt standards designed to create absolutely risk-free workplaces regardless of cost.

Held: The judgment is affirmed. Pp. 2858-2874 (opinion of STEVENS, J.); 2877-2878 (opinion of POWELL, J.); 2879-2887 (opinion of REHNQUIST, J.). 581 F.2d 493, 5th Cir., affirmed.

Mr. Justice STEVENS, joined by Mr. Chief Justice BURGER, Mr. Justice STEWART, and Mr. Justice POWELL, concluded that the standard in question is invalid. Pp. 2858-2869, 2873.

(a) The Court of Appeals was correct in refusing to enforce the 1 ppm exposure limit on the ground that it was not sup-

ported by appropriate findings. OSHA's rationale for lowering the permissible exposure limit from 10 ppm to 1 ppm was based, not on any finding that leukemia has ever been caused by exposure to 10 ppm of benzene and that it will not be caused by exposure to 1 ppm, but rather on a series of assumptions indicating that some leukemia might result from exposure to 10 ppm and that the number of cases might be reduced by lowering the exposure level to 1 ppm. Pp. 2858-2862.

(b) By empowering the Secretary to promulgate standards that are "reasonably necessary or appropriate to provide safe or healthful employment and places of employment" as required by § 3(8), the Act implies that, before promulgating any standard, the Secretary must make a finding that the workplaces in question are not safe. But "safe" is not the equivalent of "risk-free." A workplace can hardly be considered "unsafe" unless it threatens the workers with a significant risk of harm. Therefore, before the Secretary can promulgate any permanent health or safety standard, he must make a threshold finding that the place of employment is unsafe in the sense that significant risks are present and can be eliminated or lessened by a change in practices. This requirement applies to permanent standards promulgated pursuant to § 6(b)(5), as well as to other types of permanent standards, there being no reason why § 3(8)'s definition of a standard should not be deemed incorporated by reference into § 6(b)(5). Moreover, requiring the Secretary to make a threshold finding of significant risk is consistent with the scope of his regulatory power under § 6(b)(5) to promulgate standards for "toxic chemicals" and "harmful physical agents." This interpretation is supported by other provisions of the Act, such as § 6(g), which requires the Secretary, in determining the priority for establishing standards, to give due regard to the urgency of the need for mandatory safety and health standards for particular industries or workplaces, and § 6(b)(8), which requires the Secretary when he substantially alters an existing

consensus standard, to explain how the new rule will "better effectuate" the Act's purposes. Pp. 2862-2866.

(c) The Act's legislative history also supports the conclusion that Congress was concerned not with absolute safety, but with the elimination of significant harm. Pp. 2866-2869.

(d) Where the Secretary relied on a special policy for carcinogens that imposed the burden on industry of proving the existence of a safe level of exposure, thereby avoiding his threshold responsibility of establishing the need for more stringent standards, he exceeded his power. P. 2873.

Mr. Justice STEVENS, joined by Mr. Chief Justice BURGER and Mr. Justice STEWART, also concluded that:

1. The burden was on OSHA to show, on the basis of substantial evidence, that it is at least more likely than not that long-term exposure to 10 ppm of benzene presents a significant risk of material health impairment. Here, OSHA did not even attempt to carry such burden of proof. Imposing such a burden on OSHA will not strip it of its ability to regulate carcinogens, nor will it require it to wait for deaths to occur before taking any action. The requirement that a "significant" risk be identified is not a mathematical straitjacket; OSHA is not required to support its finding that a significant risk exists with anything approaching scientific certainty; and the record in this case and OSHA's own rulings on other carcinogens indicate that there are a number of ways in which OSHA can make a rational judgment about the relative significance of the risks associated with exposure to a particular carcinogen. Pp. 2869-2873.

2. OSHA did not make the required finding with respect to the dermal contact ban that the ban was "reasonably necessary and appropriate" to remove a significant risk of harm from such contact, but rather acted on the basis of the absolute, no-risk policy that it applies to carcinogens under the assumptions that not only is benzene in small doses a carcinogen but also that it can

be absorbed through the skin in sufficient amounts to present a carcinogenic risk. These assumptions are not a proper substitute for the findings of significant risk of harm required by the Act. Pp. 2873-2874.

Mr. Justice POWELL, agreeing that neither the airborne concentration standard nor the dermal contact standard satisfied the Act's requirements, would not hold that OSHA did not even attempt to carry its burden of proof on the threshold question whether exposure to benzene at 10 ppm presents a significant risk to human health. He concluded that, even assuming OSHA had met such burden, the Act also requires OSHA to determine that the economic effects of its standard bear a reasonable relationship to the expected benefits. A standard is neither "reasonably necessary" nor "feasible," as required by the Act, if it calls for expenditures wholly disproportionate to the expected health and safety benefits. Here, although OSHA did find that the "substantial costs" of the benzene regulations were justified, the record contains neither adequate documentation of this conclusion nor any evidence that OSHA weighed the relevant considerations. The agency simply announced its finding of cost-justification without explaining the method by which it determined that the benefits justified the costs and their economic effects. Pp. 2877-2878.

Mr. Justice REHNQUIST would invalidate, as constituting an invalid delegation of legislative authority to the Secretary, the relevant portion of § 6(b)(5) of the Act as it applies to any toxic substance or harmful physical agent for which a safe level is, according to the Secretary, unknown or otherwise "infeasible." In the case of such substances, the language of § 6(b)(5) gives the Secretary absolutely no indication where on the continuum of relative safety he should set the standard. Nor is there anything in the legislative history, the statutory context, or any other source traditionally examined by this Court to provide specificity to the feasibility criterion in § 6(b)(5). Pp. 2879-2887.

William H. Alsop
petitioner in No. 78

George H. Cohen
petitioner in No. 78

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William H. Alsup, Washington, D. C., for petitioner in No. 78-1036.

George H. Cohen, Washington, D. C., for petitioner in No. 78-911.

Edward W. Warren and Charles F. Lettow, Washington, D. C., for respondents.

Mr. Justice STEVENS announced the judgment of the Court and delivered an opinion in which THE CHIEF JUSTICE and Mr. Justice STEWART join and in Parts I, II, III-A-C and E of which Mr. Justice POWELL joins.

The Occupational Safety and Health Act of 1970, 29 U.S.C. § 651 et seq. (the Act), was enacted for the purpose of ensuring safe and healthful working conditions for every working man and woman in the Nation. This case concerns a standard promulgated by the Secretary of Labor to regulate occupational exposure to benzene, a substance which has been shown to cause cancer at high exposure levels. The principal question is whether such a showing is a sufficient basis for a standard that places the most stringent limitation on exposure to benzene that is technologically and economically possible.

The Act delegates broad authority to the Secretary to promulgate different kinds of standards. The basic definition of an "occupational safety and health standard" is found in § 3(8), which provides:

"The term 'occupational safety and health standard' means a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment." 29 U.S.C. § 652(8).

1. The second and third sentences of this section, which impose feasibility limits on the Secretary and allow him to take into account the best available evidence in developing standards, may apply to all health and safety standards. This conclusion follows if the term "subsection" used in the second sentence refers to the entire subsection 655(b) (which sets out procedures for the adoption of all types of health and safety standards), rather than simply to the toxic materials subsection, § 655(b)(5). While Mr. Justice MARSHALL,

Where toxic materials or harmful physical agents are concerned, a standard must also comply with § 6(b)(5), which provides:

"The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under this subsection, shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life. Development of standards under this subsection shall be based upon research, demonstrations, experiments, and such other information as may be appropriate. In addition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws." 29 U.S.C. § 655(b)(5).¹

Wherever the toxic material to be regulated is a carcinogen, the Secretary has taken the position that no safe exposure level can be determined and that § 6(b)(5) requires him to set an exposure limit at the lowest technologically feasible level that will not impair the viability of the industries regulated. In this case, after having determined that there is a causal connection between benzene and leukemia (a cancer of the white blood cells), the Secretary set an exposure limit on airborne concentrations of benzene of one part benzene per million.

post, at 2890, and respondents agree with this position, see Brief for Respondents, at 39; see also Currie, "OSHA," 1976 Am.Bar Foundation Research J. 1107, 1137, n. 151, the Government does not, see Brief for Federal Parties, at 58; see also Berger & Riskin, "Economic and Technological Feasibility in Regulating Toxic Substances under the Occupational Safety and Health Act," 7 Ecol.L.Q. 285, 294 (1978). There is no need for us to decide this issue in this case.

parts of air (1 ppm), regulated dermal and eye contact with solutions containing benzene, and imposed complex monitoring and medical testing requirements on employers whose workplaces contain 0.5 ppm or more of benzene. 29 CFR § 1910.1028, 43 Fed. Reg. 5918 (Feb. 10, 1978), as amended, 43 Fed. Reg. 27962 (June 27, 1978).

On pre-enforcement review pursuant to 29 U.S.C. § 655(f), the United States Court of Appeals for the Fifth Circuit held the regulation invalid. 581 F.2d 493 (1978). The court concluded that OSHA² had exceeded its standard-setting authority because it had not shown that the new benzene exposure limit was "reasonably necessary or appropriate to provide safe or healthful employment" as required by § 3(8),³ and because § 6(b)(5) does "not give OSHA the unbridled discretion to adopt standards designed to create absolutely risk-free workplaces regardless of costs."⁴ Reaching the two provisions together, the Fifth Circuit held that the Secretary was under a duty to determine whether the benefits expected from the new standard

bore a reasonable relationship to the costs that it imposed. *Id.*, at 503. The court noted that OSHA had made an estimate of the costs of compliance, but that the record lacked substantial evidence of any discernible benefits.⁵

[1] We agree with the Fifth Circuit's holding that § 3(8) requires the Secretary to find, as a threshold matter, that the toxic substance in question poses a significant health risk in the workplace and that a new, lower standard is therefore "reasonably necessary or appropriate to provide safe or healthful employment and places of employment." Unless and until such a finding is made, it is not necessary to address the further question whether the Court of Appeals correctly held that there must be a reasonable correlation between costs and benefits, or whether, as the Government argues, the Secretary is then required by § 6(b)(5) to promulgate a standard that goes as far as technologically and economically possible to eliminate the risk.

Because this is an unusually important case of first impression, we have reviewed

safety laws.⁶ Moreover, in standards dealing with toxic materials, just as with all other occupational safety and health standards, the conditions and other requirements imposed by the standard must be 'reasonably necessary or appropriate to provide safe or healthful employment and places of employment.' 29 U.S.C. § 652(8). 581 F.2d, at 502.

5. "The lack of substantial evidence of discernible benefits is highlighted when one considers that OSHA is unable to point to any empirical evidence documenting a leukemia risk at 10 ppm even though that has been the permissible exposure limit since 1971. OSHA's assertion that benefits from reducing the permissible exposure limit from 10 ppm to 1 ppm are likely to be appreciable, an assumption based only on inferences drawn from studies involving much higher exposure levels rather than on studies involving these levels or sound statistical projections from the high-level studies, does not satisfy the reasonably necessary requirement limiting OSHA's action. *Aqua Slide* requires OSHA to estimate the extent of expected benefits in order to determine whether those benefits bear a reasonable relationship to the standard's demonstrably high costs." *Id.*, at 503-504.

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2. The Occupational Safety and Health Administration (OSHA) is the administrative agency within the Department of Labor that is responsible for promulgating and enforcing standards under the Act. In this opinion, we refer to the "Secretary," "OSHA" and the "Agency" interchangeably.

3. "The Act imposes on OSHA the obligation to enact only standards that are reasonably necessary or appropriate to provide safe or healthful workplaces. If a standard does not fit in this definition, it is not one that OSHA is authorized to enact." 581 F.2d, at 502.

4. "Although 29 U.S.C.A. § 655(b)(5) requires the goal of attaining the highest degree of health and safety protection for the employee, it does not give OSHA the unbridled discretion to adopt standards designed to create absolutely risk-free workplaces regardless of cost. To the contrary, that section requires standards to be feasible, and it contains a number of pragmatic limitations in the form of specific kinds of information OSHA must consider in enacting standards dealing with toxic materials. Those include 'the best available evidence,' 'research, demonstrations, experiments, and such other information as may be appropriate,' 'the latest available scientific data in the field,' and 'experience gained under this and other health and

the record with special care. In this opinion, we (1) describe the benzene standard, (2) analyze the Agency's rationale for imposing a 1 ppm exposure limit, (3) discuss the controlling legal issues, and (4) comment briefly on the dermal contact limitation.

I-

Benzene is a familiar and important commodity. It is a colorless, aromatic liquid that evaporates rapidly under ordinary atmospheric conditions. Approximately 11 billion pounds of benzene were produced in the United States in 1976. Ninety-four percent of that total was produced by the petroleum and petrochemical industries, with the remainder produced by the steel industry as a byproduct of coking operations. Benzene is used in manufacturing a variety of products including motor fuels (which may contain as much as 2% benzene), solvents, detergents, pesticides, and other organic chemicals. 43 Fed.Reg. at 5918.

The entire population of the United States is exposed to small quantities of benzene, ranging from a few parts per billion to 0.5 ppm, in the ambient air. Tr. 1030-1032. Over one million workers are subject to additional low-level exposures as a conse-

quence of their employment. The majority of these employees work in gasoline service stations, benzene production (petroleum refineries and coking operations), chemical processing, benzene transportation, rubber manufacturing and laboratory operations.⁶

Benzene is a toxic substance. Although it could conceivably cause harm to a person who swallowed or touched it, the principal risk of harm comes from inhalation of benzene vapors. When these vapors are inhaled, the benzene diffuses through the lungs and is quickly absorbed into the blood. Exposure to high concentrations produces an almost immediate effect on the central nervous system. Inhalation of concentrations of 20,000 ppm can be fatal within minutes; exposures in the range of 250 to 500 ppm can cause vertigo, nausea, and other symptoms of mild poisoning. 43 Fed.Reg., at 5921. Persistent exposures at levels above 25-40 ppm may lead to blood deficiencies and diseases of the blood-forming organs, including aplastic anemia, which is generally fatal.

Industrial health experts have long been aware that exposure to benzene may lead to various types of nonmalignant diseases. By 1948 the evidence connecting high levels of benzene to serious blood disorders had become so strong that the Commonwealth of

6. OSHA's figures indicate that 795,000 service station employees have some heightened exposure to benzene as a result of their employment. See Economic Impact Statement, Vol. II, D-7 (May, 1977). These employees are specifically excluded from the regulation at issue in this case. See *infra*, at 17. OSHA states that another 629,000 employees, who are covered by the regulation, work in the other industries described. 43 Fed.Reg., at 5935.

It is not clear from the record or its explanation of the permanent standard how OSHA arrived at the estimate of 629,000 exposed employees. OSHA's consultant, Arthur D. Little Company, estimated that there were 191,000 exposed employees, 30,000 of whom were exposed to 1 ppm or more of benzene. Economic Impact Statement, Vol. I, 7-1. In its explanation of the permanent standard OSHA stated that there were 1,440 exposed employees who worked in benzene plants, 98,000 in other petroleum refineries, 24,000 in coke ovens, 4,000 in light oil plants, 2,760 in the petrochemical

industry, 52,345 who worked in bulk terminals, 23,471 drivers who loaded benzene from those terminals, 74,000 in oil and gas production, 17,000 in pipeline work, 100 at tank car facilities, 200 at tank truck facilities, 480 on barges, 11,400 in tire-manufacturing plants, and 13,050 in other types of rubber production. 43 Fed.Reg., at 5936-5938. Although OSHA gave no estimate for laboratory workers, the A. D. Little study indicated that there were 25,000 exposed workers in that industry. These figures, add up to 347,246 exposed employees—approximately 282,000 less than the overall estimate of 629,000. It is possible that some of all of these employees work in the "other industries" briefly described in OSHA's explanation; these are primarily small firms that manufacture adhesives, paint and ink or that use benzene solvents. 43 Fed.Reg., at 5939. No estimate of the number of exposed employees in those industries or the aggregate cost of compliance by those industries is given either by OSHA or by A. D. Little in its consulting report.

Massachusetts imposed a 35 ppm limitation on workplaces within its jurisdiction. In 1969 the American National Standards Institute adopted a national consensus standard of 10 ppm, averaged over an eight-hour period with a ceiling concentration of 25 ppm for 10-minute periods or a maximum peak concentration of 50 ppm. 43 Fed.Reg., at 5919. In 1971, after the Occupational Health and Safety Act was passed, the Secretary adopted this consensus standard as the federal standard, pursuant to 29 U.S.C. § 655(a).⁷

As early as 1928, some health experts theorized that there might also be a connection between benzene in the workplace and leukemia.⁸ In the late 1960's and early 1970's a number of epidemiological studies

7. Section 6(a) of the Act, 29 U.S.C. § 655(a), provides that

"Without regard to chapter 5 of Title 5 or to the other subsections of this section, the Secretary shall, as soon as practicable during the period beginning with the effective date of this chapter and ending two years after such date, by rule promulgate as an occupational safety or health standard any national consensus standard, and any established Federal standard, unless he determines that the promulgation of such a standard would not result in improved safety or health for specifically designated employees. In the event of conflict among any standards, the Secretary shall promulgate the standard which assures the greatest protection of the safety or health of the affected employees."

In this case the Secretary complied with the directive to choose the most protective standard by selecting the ANSI standard of 10 ppm, rather than the 25 ppm standard adopted by the American Conference of Government Industrial Hygienists. 43 Fed.Reg., at 5919.

8. See Delore & Borgamano, "Leucemie aigue au cours de l'intoxication benzenique. Sur l'origine toxique de certaines leucemies aigues et leurs relations avec les anemies graves," 9 J.Med. Lyon 227 (1928). A translation of that document appears in the benzene administrative record. Vol. II, Ex. 2-60. See also Hunter, "Chronic Exposure to Benzene (Benzol) II. The Clinical Effects," 21 J.Ind. & Toxicol. 331 (1939), Vol. II, Ex. 2-74, which refers to "leucemia" as a side effect of chronic exposure to benzene.

9. Dr. Muzaffer Aksoy, a Turkish physician who testified at the hearing on the proposed benzene standard, did a number of studies con-

were published indicating that workers exposed to high concentrations of benzene were subject to significantly increased risk of leukemia.⁹ In a 1974 report recommending a permanent standard for benzene, the National Institute of Occupational Health and Safety (NIOSH), OSHA's research arm,¹⁰ noted that these studies raised the "distinct possibility" that benzene caused leukemia. But, in light of the fact that all known cases had occurred at very high exposure levels, NIOSH declined to recommend a change in the 10 ppm standard, which it considered sufficient to protect against nonmalignant diseases. NIOSH suggested that further studies were necessary to determine conclusively whether there was a link between benzene and leu-

cerning the effects of benzene exposure on Turkish shoemakers. The workers in Dr. Aksoy's studies used solvents containing large percentages of benzene and were constantly exposed to high concentrations of benzene vapors (between 150 and 650 ppm) under poorly ventilated and generally unhygienic conditions. See Aksoy, "Acute Leukemia Due to Chronic Exposure to Benzene," 52 Am.J. of Medicine 160 (1972), Vol. I, Ex. 2-29; Aksoy, "Benzene (Benzol): Its Toxicity and Effects on the Hematopoietic System" (Monograph) (1970), Vol. II, Ex. 2-55; Aksoy, "Leukemia in Shoe-Workers Exposed Chronically to Benzene," 44 Blood 837 (1974), Vol. II, Ex. 2-53 (reporting on 26 shoe-workers who had contracted leukemia from 1967 to 1973; this represented an incidence of 13 per 100,000 rather than the 6 cases per 100,000 that would normally be expected).

Dr. Enrico Vigliani also reported an excess number of leukemia cases among Italian shoemakers exposed to glues containing a high percentage of benzene and workers in rotogravure plants who had been exposed over long periods of time to inks and solvents containing as much as 60% benzene. See Vigliani, "Benzene & Leukemia," 1964 New Eng.J. of Medicine 872-876, Vol. I, Ex. 2-27; Forni & Vigliani, "Chemical Leukemogenesis in Man," 7 Ser.Haemat. 211 (1974), Vol. II, Ex. 2-50.

10. 29 U.S.C. § 669(a)(3) requires HEW to develop "criteria" dealing with toxic materials and harmful physical agents that describe "exposure levels that are safe for various periods of employment." HEW's obligations under this section have been delegated to NIOSH, 29 U.S.C. § 671.

kemia and, if dangerous."¹¹

Between 1974 and 1976, several studies were published which viewed that benzene was at least when an August 1974 commendation of studies provided a connection between benzene and leukemia. Vol. I, Ex. 2-37. It is noted that none of the studies provided the data found lacking in NIOSH's previous exposure limit.

11. See Critical Review of Occupational Health and Safety, Vol. I, Ex. 2-37. Director of NIOSH stated that the studies designed to further research on the health effects of benzene and leukemia were inadequate.

12. Aksoy's previous studies reported on the health effects of benzene. He uncovered a link between benzene and leukemia. He noted that a solvent he used in his studies had a high percentage of benzene. He reported leukemia in shoe-workers exposed to benzene. Aksoy, "Typhoid Poisoning," 1976, Vol. II, Ex. 2-53. He noted a decline in leukemia cases in shoe-workers who had been exposed to benzene. Vigliani & Forni, "Leukemia and Benzene," 1976, Vol. II, Ex. 2-53. Vigliani noted that benzene solvents used in shoe-making had been exposed to concentrations of 1500 ppm.

A number of studies have also been done during this period which indicate a connection between contracting leukemia and heavily exposed workers to benzene. "Solvent Exposure in Shoe Workers," 1976, Vol. II, Ex. 2-37. See also, "Mortality and Morbidity in Shoe Workers," 1976, Vol. II, Ex. 2-37.

kemia and, if so, what exposure levels were dangerous.¹¹

Between 1974 and 1976 additional studies were published which tended to confirm the view that benzene can cause leukemia, at least when exposure levels are high.¹² In an August 1976 revision of its earlier recommendation, NIOSH stated that these studies provided "conclusive" proof of a causal connection between benzene and leukemia. Vol. I, Ex. 2-5. Although it acknowledged that none of the intervening studies had provided the dose-response data it had found lacking two years earlier, *id.*, at 9, NIOSH nevertheless recommended that the exposure limit be set low as possible. As a

result of this recommendation, OSHA contracted with a consulting firm to do a study on the costs to industry of complying with the 10 ppm standard then in effect or, alternatively, with whatever standard would be the lowest feasible. Tr. 505-506.

In October 1976 NIOSH sent another memorandum to OSHA, seeking acceleration of the rulemaking process and "strongly" recommending the issuance of an emergency temporary standard pursuant to 29 U.S.C. § 655(c)¹³ for benzene and two other chemicals believed to be carcinogens. NIOSH recommended that a 1 ppm exposure limit be imposed for benzene.¹⁴ Vol. I,

ber Workers, 1964-1973," 18 J. of Occup. Med. 387 (1976), Vol. II, Ex. 2-57 (also indicating an excess mortality rate from leukemia among rubber workers).

13. Section 655(c) provides:

"(1) The Secretary shall provide, without regard to the requirements of chapter 5 of title 5, for an emergency temporary standard to take immediate effect upon publication in the Federal Register if he determines (A) that employees are exposed to grave danger from exposure to substances or agents determined to be toxic or physically harmful or from new hazards, and (B) that such emergency standard is necessary to protect employees from such danger.

"(2) Such standard shall be effective until superseded by a standard promulgated in accordance with the procedures prescribed in paragraph (3) of this subsection.

"(3) Upon publication of such standard in the Federal Register the Secretary shall commence a proceeding in accordance with subsection (b) of this section, and the standard as published shall also serve as a proposed rule for the proceeding. The Secretary shall promulgate a standard under this paragraph no later than six months after publication of the emergency standard as provided in paragraph (2) of this subsection."

11. See Criteria for a Recommended Standard/Occupational Exposure to Benzene 74-75, Vol. I, Ex. 2-3. In response to a letter from the Director of the Office of Standards Division, NIOSH stated that its 10 ppm standard was designed to protect against leukemia, as well as other health risks, NIOSH noted, however, that further research was necessary in order to establish adequate dose-response data for benzene and leukemia. Vol. XII, Ex. 32A, 32B.

12. Aksoy published another study in 1976 reporting on an additional eight leukemia cases uncovered after 1973. In that article, he also noted that a 1969 ban on the use of benzene as a solvent had led to a decline in the number of reported leukemia cases beginning in 1974. Aksoy, "Types of Leukemia in Chronic Benzene Poisoning," 55 Acta Haematologica 65 (1976), Vol. I, Ex. 2-30. Vigliani also noted a decline in leukemia cases in Italy after benzene was no longer used in glues and inks. See Vigliani & Forni, "Benzene and Leukemia," 11 Environmental Res. 122 (1976), Vol. I, Ex. 2-15; Vigliani, "Leukemia Associated with Benzene Exposure," 271 Annals N. Y. Acad. of Sciences 143 (1976), Vol. II, Ex. 2-49. In the latter study Vigliani noted that in the past 100% pure benzene solvents had been used and workers had been exposed on a prolonged basis to concentrations of 200-500 ppm, with peaks of up to 1500 ppm.

A number of epidemiological studies were also done among American rubber workers during this period. Dr. A. J. McMichael's studies indicated a nine-fold increase in the risk of contracting leukemia among workers who were heavily exposed in the 1940's and 1950's to pure benzene used as a solvent. McMichael, "Solvent Exposure and Leukemia Among Rubber Workers: An Epidemiologic Study," 17 J. of Occup. Med. 234, 238 (1975), Vol. II, Ex. 2-37. See also Andjelkovic, Taulbee & Symons, "Mortality Experience of a Cohort of Rub-

14. At the hearing on the permanent standard NIOSH representatives testified that they had selected 1 ppm initially in connection with the issuance of a proposed standard for vinyl chloride. In that proceeding they had discovered that 1 ppm was approximately the lowest level detectable through the use of relatively unsophisticated monitoring instruments. With respect to benzene, they also thought that 1 ppm was an appropriate standard because any lower standard might require the elimination of the small amounts of benzene (in some places up

Ex. 2-6. Apparently because of the NIOSH recommendation, OSHA asked its consultant to determine the cost of complying with a 1 ppm standard instead of with the "minimum feasible" standard. Tr. 506-507. It also issued voluntary guidelines for benzene, recommending that exposure levels be limited to 1 ppm on an 8-hour time-weighted average basis wherever possible. Vol. II, Ex. 2-44.

In the spring of 1976 NIOSH had selected two Pliofilm plants in St. Mary's and Akron, Ohio, for an epidemiological study of the link between leukemia and benzene exposure. In April, 1977 NIOSH forwarded an interim report to OSHA indicating at least a five-fold increase in the expected incidence of leukemia for workers who had been exposed to benzene at the two plants from 1940 to 1949.¹⁵ The report submitted to OSHA erroneously suggested that exposures in the two plants had generally been between zero and 15 ppm during the period

to 0.5 ppm) that are normally present in the atmosphere. Tr. 1142-1143. NIOSH's recommendation was not based on any evaluation of the feasibility, either technological or economic, of eliminating all exposures above 1 ppm. Tr. 1156.

15. Seven fatalities from leukemia were discovered out of the 748 workers surveyed. However, Dr. Infante, who conducted the study, stated that his statistical techniques had probably underestimated the number of leukemia cases that had actually occurred. Tr. 747. The normal expected incidence of leukemia in such a population would be 1.4. Vol. II, Ex. 2-51, at 6.

16. The authors' statement with respect to exposure levels was based on a 1946 report by the Ohio Industrial Commission indicating that, after some new ventilation equipment had been installed, exposures at the St. Mary's plant had been brought within "safe" limits, in most instances ranging from zero to 10 to 15 ppm. Vol. II, Ex. 2-51, at 3. As the authors later admitted, the level considered "safe" in 1946 was 100 ppm. Tr. 814-815. Moreover, only one of the seven workers who died of leukemia had begun working at St. Mary's after 1946. Five of the others had worked at the Akron plant, which employed 310 of the 748 workers surveyed. Tr. 2537-2538. A 1948 report by the same Commission indicated exposure levels at the Akron plant of well over 100 ppm, with excursions in some areas up to 1000 ppm. Vol.

in question.¹⁶ As a result of this new evidence and the continued prodding of NIOSH, Vol. I, Ex. 2-7, OSHA did issue an emergency standard effective May 21, 1977, reducing the benzene exposure limit from 10 ppm to 1 ppm, the ceiling for exposures of up to 10 minutes from 25 ppm to 5 ppm, and eliminating the authority for peak concentrations of 50 ppm. 42 Fed.Reg. 22516 (May 3, 1977). In its explanation accompanying the emergency standard, OSHA stated that benzene had been shown to cause leukemia at exposures below 25 ppm and that, in light of its consultant's report, it was feasible to reduce the exposure limit to 1 ppm. 42 Fed.Reg., at 22517, 22521.

On May 19, 1977, the Court of Appeals for the Fifth Circuit entered a temporary restraining order preventing the emergency standard from taking effect. Thereafter, OSHA abandoned its efforts to make the emergency standard effective and instead issued a proposal for a permanent standard

XVII, Ex. 84A (App. A, Attach. F). Surveys taken in the intervening years, as well as testimony by St. Mary's employees at the hearing on the proposed standard, Tr. 3432-3437, indicated that both of the plants may have had relatively high exposures through the 1970's.

Industry representatives argued at the hearing that this evidence indicated that the exposure levels had been very high, as they had been in the other epidemiological studies conducted in the past. See API post-hearing brief, Vol. XXXI, Ex. 217-33, at 23-37. NIOSH witnesses, however, simply stated that actual exposure levels for the years in question could not be determined; they did agree, however, that their study should not be taken as proof of a five-fold increase in leukemia risk at 10-15 ppm. Tr. 814-815. In its explanation of the permanent standard, OSHA agreed with the NIOSH witnesses that no dose-response relationship could be inferred from the study: "Comments at the hearing demonstrated that there were area exposures during this study period exceeding these levels [10-15 ppm], at times reaching values of hundreds of parts per million. Since no personal monitoring data are available, any conclusion regarding the actual individual time-weighted average exposure is speculative. Because of the lack of definitive exposure data, OSHA cannot derive any conclusions linking the excess leukemia risk with any specific exposure level." 43 Fed.Reg., at 5972.

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patterned almost entirely after the aborted emergency standard. 42 Fed.Reg. 27452 (May 27, 1977).

In its published statement giving notice of the proposed permanent standard, OSHA did not ask for comments as to whether or not benzene presented a significant health risk at exposures of 10 ppm or less. Rather, it asked for comments as to whether 1 ppm was the minimum feasible exposure limit.¹⁷ 42 Fed.Reg., at 27452. As OSHA's Deputy Director of Health Standards, Grover Wrenn, testified at the hearing, this formulation of the issue to be considered by the Agency was consistent with OSHA's general policy with respect to carcinogens.¹⁸ Whenever a carcinogen is involved, OSHA will presume that no safe level of exposure exists in the absence of clear proof estab-

17. OSHA also sought public comment as to whether certain industries should be exempt from compliance, whether the proposed compliance procedures and labeling techniques were adequate, what the environmental and economic consequences of the regulation would be, and whether it was feasible to replace benzene in solvents and other products of which it constituted more than 1%.

18. It became clear at the hearing that OSHA had not promulgated the proposed standard in response to any new concern about the non-malignant effects of low-level benzene exposure. See Tr. 126-127.

"Is it accurate to say that the reason why the—why OSHA has proposed to reduce the exposure limits in the standard below the current levels is because of a perceived risk of leukemia, and not because of any new evidence it has received that the current standards are inadequate to protect against acute or chronic benzene toxicity, other than leukemia?"

"MR. WRENN: I think I will simply refer the part of my statement you were referring to, in which it says, it is however benzene's leukemogenicity which is of greatest concern to OSHA. That is certainly the central issue within the ETS [emergency temporary standard] and the proposed standard."

19. Mr. Wrenn testified that:

"The proposed standard requires that employee exposure to benzene in air be reduced to one part per million; with a five part per million ceiling allowable over any fifteen minute period during an eight hour work shift, and prohibits eye or prolonged skin contact with liquid benzene.

lishing such a level and will accordingly set the exposure limit at the lowest level feasible.¹⁹ The proposed 1 ppm exposure limit in this case thus was established not on the basis of a proven hazard at 10 ppm, but rather on the basis of "OSHA's best judgment at the time of the proposal of the feasibility of compliance with the proposed standard by the affected industries." Tr. 30. Given OSHA's cancer policy, it was in fact irrelevant whether there was any evidence at all of a leukemia risk at 10 ppm. The important point was that there was no evidence that there was *not* some risk, however small, at that level. The fact that OSHA did not ask for comments on whether there was a safe level of exposure for benzene was indicative of its further view that a demonstration of such absolute safety simply could not be made.²⁰

"This airborne exposure limit is based on OSHA's established regulatory policy, that in the absence of a demonstrated safe level, or a no effect level for a carcinogen, it will be assumed that none exist, and that the agency will attempt to limit employee exposure to the lowest level feasible." Tr. 29-30. See also:

"MR. WARREN: Mr. Wrenn, in promulgating the emergency temporary, and proposed permanent, benzene standards, OSHA relies heavily, and I am quoting from your testimony now, on the regulatory policy that there is no safe level for carcinogens at any—for any exposed population, and the fact that leukemia, and a leukemogen is a carcinogen, is that correct?"

"MR. WRENN: I believe that I stated that slightly differently in my oral summary of the statement than it is stated in the statement itself. I said that in the absence of a known or demonstrated safe level or no effect level, our policy is to assume that none exists, and to regulate accordingly." Tr. 48-49.

"MR. WRENN: I would prefer to state it as I have on a couple of occasions already this morning, and that in the absence of a demonstrated safe level of exposure, we will assume that none exists for the purpose of regulatory policy." Tr. 50.

20. In answer to the question of what demonstration would suffice to establish a "safe level," Mr. Wrenn stated:

"I would like to draw a distinction, however, between what I have referred to as the demonstration that a safe level exists, and speculation

Public hearings were held on the proposed standard, commencing on July 19, 1977. The final standard was issued on February 10, 1978. 43 Fed.Reg. 5918.²¹ In its final form, the benzene standard is designed to protect workers from whatever hazards are associated with low-level benzene exposures by requiring employers to monitor workplaces to determine the level of exposure, to provide medical examinations when the level rises above 0.5 ppm, and to institute whatever engineering or other controls are necessary to keep exposures at or below 1 ppm.

In the standard as originally proposed by OSHA, the employer's duty to monitor, keep records and provide medical examinations arose whenever any benzene was present in a workplace covered by the rule.²² Because benzene is omnipresent in small quantities, NIOSH and the President's Council on Wage and Price Stability recommended the use of an "action level" to trigger monitoring and medical examina-

or elaborate theories that one may make, and I think that the agency in its history and very likely its future regulatory policy, would, in the face of evidence demonstrating that a carcinogenic hazard does exist or did exist, in this particular set of circumstances, would be very reluctant to accept as the basis for its regulatory decisions, a theoretical argument that a safe level may, in fact, exist for a particular substance." Tr. 51-52.

A NIOSH representative who testified later put it more succinctly, stating that "if benzene causes leukemia and if leukemia is a cancer, then exposure is almost moot." Tr. 1007.

21. An amendment to the standard was promulgated on June 27, 1978. 43 Fed.Reg. 27962. See n. 22, *infra*.

22. Apart from its exclusion of gasoline storage and distribution facilities (an exclusion retained in the final rule, see text, at n. 25, *infra*), the proposed rule also excluded from coverage work operations in which liquid mixtures containing one percent or less benzene were used. After a year this exclusion was to be narrowed to operations where 0.1% benzene solutions were used. The rationale for the exclusion was that airborne exposures from such liquids would generally be within the 1 ppm limit. However, testimony at the hearing on the proposed rule indicated that there was no "consistent predictable relationship" between benzene

tion requirements. Tr. 1030-1032; Vol. XIV, Ex. 41-28. OSHA accepted this recommendation, providing under the final standard that, if initial monitoring discloses benzene concentrations below 0.5 ppm averaged over an eight-hour work day, no further action is required unless there is a change in the company's practices.²³ If exposures are above the action level, but below the 1 ppm exposure limit, employers are required to monitor exposure levels on a quarterly basis and to provide semiannual medical examinations for their exposed employees. Neither the concept of an action level, nor the specific level selected by OSHA, is challenged in this proceeding.

Whenever initial monitoring indicates that employees are subject to airborne concentrations of benzene above 1 ppm averaged over an eight-hour workday, with a ceiling of 5 ppm for any 15-minute period, employers are required to modify their plants or institute work practice controls to reduce exposures within permissible limits.

content in a liquid and the resulting airborne exposure. Therefore, OSHA abandoned the idea of a percentage exclusion for liquid benzene in its final standard. 43 Fed.Reg., at 5942.

OSHA later reconsidered its position and, in an amendment to the permanent standard, re-instated an exclusion for liquids, setting the level at 0.5%, to be reduced to 0.1% after three years, 43 Fed.Reg. 27962 (June 27, 1978).

23. The exemption from the monitoring and medical testing portions of the standard for workplaces with benzene exposure levels below 0.5 ppm was not predicated on any finding that regulation of such workplaces was not feasible. OSHA's consultant, Arthur D. Little Co., concluded that 1 ppm was a feasible exposure limit even assuming that there was no action level (or, to put it another way, assuming that the action level was zero). Rather, it was, as NIOSH witnesses stated, a practical decision based on a determination that, where benzene exposures are below 0.5 ppm, they will be unlikely ever to rise above the permissible exposure level of 1 ppm. NIOSH was also concerned that, in the absence of an action level, employers who used sophisticated analytical equipment might be required to monitor and provide medical examinations simply because of the presence of benzene in the ambient air. Tr. 1030-1032, 1133-1134.

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Consistent with OSHA's general policy, the regulation does not allow respirators to be used if engineering modifications are technologically feasible.²⁴ Employers in this category are also required to perform monthly monitoring so long as their workplaces remain above 1 ppm, provide semiannual medical examinations to exposed workers, post signs in and restrict access to "regulated areas" where the permissible exposure limit is exceeded, and conduct employee training programs where necessary.

The standard also places strict limits on exposure to liquid benzene. As originally framed, the standard totally prohibited any skin or eye contact with any liquid containing any benzene. Ultimately, after the standard was challenged, OSHA modified this prohibition by excluding liquids containing less than 0.5% benzene. After three years, that exclusion will be narrowed to liquids containing less than 0.1% benzene.

The permanent standard is expressly inapplicable to the storage, transportation, distribution, sale or use of gasoline or other

fuels subsequent to discharge from bulk terminals.²⁵ This exception is particularly significant in light of the fact that over 795,000 gas station employees, who are exposed to an average of 102,700 gallons of gasoline (containing up to 2% benzene) annually, are thus excluded from the protection of the standard.²⁶

As presently formulated, the benzene standard is an expensive way of providing some additional protection for a relatively small number of employees. According to OSHA's figures, the standard will require capital investments in engineering controls of approximately \$266 million, first-year operating costs (for monitoring, medical testing, employee training and respirators) of \$187 million to \$205 million and recurring annual costs of approximately \$34 million.²⁷ 43 Fed.Reg., at 5934. The figures outlined in OSHA's explanation of the costs of compliance to various industries indicate that only 35,000 employees would gain any benefit from the regulation in terms of a reduction in their exposure to benzene.²⁸ Over

stating that it was in the process of studying whether and to what extent it should regulate exposures to gasoline in general. 43 Fed.Reg., at 5943.

24. Indeed, in its explanation of the standard OSHA states that an employer is required to institute engineering controls (for example, installing new ventilation hoods) even if those controls are insufficient, by themselves, to achieve compliance and respirators must therefore be used as well. 43 Fed.Reg., at 5952. OSHA's preference for engineering modifications is based on its opinion that respirators are rarely used properly (because they are uncomfortable, are often not properly fitted, etc.) and therefore cannot be considered adequate protective measures.

25. It is also inapplicable to work operations involving 0.5% liquid benzene (0.1% after three years), see n. 22, *supra*, and to the handling of benzene in sealed containers or systems, except insofar as employers are required to provide cautionary notices and appropriate employee training.

26. Prior to the introduction of the action level concept, A. D. Little estimated that compliance costs for the service station industry might be as high as \$4 billion. Tr. 508-509. Moreover, A. D. Little's Economic Impact Statement indicated that service station employees were generally exposed to very low levels of benzene. Vol. I, at 4-21. Still, in its explanation accompanying the permanent standard OSHA did not rule out regulation of this industry entirely,

27. OSHA's estimate of recurring annual costs was based on the assumption that the exposure levels it had projected would be confirmed by initial monitoring and that, after the first year, engineering controls would be successful in bringing most exposures within the 1 ppm limit. Under these circumstances, the need for monitoring, medical examinations and respirators would, of course, be drastically reduced.

28. Three hundred of these employees work in benzene plants, 5,000 in other petroleum refineries, 4,000 in light oil plants, 552 in the petrochemical industry, 156 in benzene transportation, 1,250 in laboratories, 11,400 in tire-manufacturing plants and 13,050 in other rubber-manufacturing plants. OSHA also estimated that another 16,216 workers (5,000 in petroleum refineries, 1,104 in the petrochemical industry, 7,300 in bulk terminals, 312 in benzene transportation and 2,500 in laboratories) would be exposed to 0.5 to 1 ppm of benzene and thus would receive a benefit in terms of more comprehensive medical examinations. 43 Fed.Reg., at 5936-5938.

two-thirds of these workers (24,450) are employed in the rubber manufacturing industry. Compliance costs in that industry are estimated to be rather low, with no capital costs and initial operating expenses estimated at only \$34 million (\$1390 per employee); recurring annual costs would also be rather low, totalling less than \$1 million. By contrast, the segment of the petroleum refining industry that produces benzene would be required to incur \$24 million in capital costs and \$600,000 in first-year operating expenses to provide additional protection for 300 workers (\$82,000 per employee), while the petrochemical industry would be required to incur \$20.9 million in capital costs and \$1 million in initial operating expenses for the benefit of 552 employees (\$39,675 per employee).²⁹ 43 Fed.Reg., at 5936-5938.

Although OSHA did not quantify the benefits to each category of worker in terms of decreased exposure to benzene, it appears from the economic impact study done at OSHA's direction that those benefits may be relatively small. Thus, although the current exposure limit is 10 ppm, the actual exposures outlined in that study are often considerably lower. For example, for the period 1970-1975 the petrochemical industry reported that, out of a total of 496 employees exposed to benzene,

29. The high cost per employee in the latter two industries is attributable to OSHA's policy of requiring engineering controls rather than allowing respirators to be used to reduce exposures to the permissible limit. The relatively low estimated cost per employee in the rubber industry is based on OSHA's assumption that other solvents and adhesives can be substituted for those that contain benzene and that capital costs will therefore not be required.

30. The other issue before us is whether the Court of Appeals correctly refused to enforce the dermal contact ban. That issue is discussed in Part IV, *infra*.

In the court below respondents also challenged the monitoring and medical testing requirements, arguing that certain industries should have been totally exempt from them and that, as to other industries, the Agency had not demonstrated that all the requirements were reasonably necessary to ensure worker health and safety. They also argued that

only 53 were exposed to levels between 1 and 5 ppm and only seven (all at the same plant) were exposed to between 5 and 10 ppm. Economic Impact Study, Vol. I, table 4.2. See also tables 4.3-4.8 (indicating sample exposure levels in various industries).

II

[2] The critical issue at this point in the litigation is whether the Court of Appeals was correct in refusing to enforce the 1 ppm exposure limit on the ground that it was not supported by appropriate findings.³⁰

[3] Any discussion of the 1 ppm exposure limit must, of course, begin with the Agency's rationale for imposing that limit.³¹ The written explanation of the standard fills 184 pages of the printed appendix. Much of it is devoted to a discussion of the voluminous evidence of the adverse effects of exposure to benzene at levels of concentration well above 10 ppm. This discussion demonstrates that there is ample justification for regulating occupational exposure to benzene and that the prior limit of 10 ppm, with a ceiling of 25 ppm (or a peak of 50 ppm) was reasonable. It does not, however, provide direct support for the Agency's conclusion that the limit should be reduced from 10 ppm to 1 ppm.

OSHA's requirement that the permissible exposure limit be met through engineering controls rather than through respirators was not reasonably necessary under the Act. Because it invalidated the 1 ppm exposure limit, the Fifth Circuit had no occasion to deal with these issues, and they are not now before this Court.

31. As we have often held, the validity of an agency's determination must be judged on the basis of the agency's stated reasons for making that determination. See *SEC v. Chenery Corp.*, 318 U.S. 80, 95, 63 S.Ct. 454, 462, 87 L.Ed. 626 ("[A]n administrative order cannot be upheld unless the grounds upon which the agency acted in exercising its powers were those upon which its action can be sustained"); *FPC v. Texaco, Inc.*, 417 U.S. 380, 397, 94 S.Ct. 2315, 2326, 41 L.Ed.2d 141; *FTC v. Sperry & Hutchinson Co.*, 405 U.S. 233, 249, 92 S.Ct. 898, 907, 31 L.Ed.2d 170.

The evidence of adverse effects of 10 ppm is sketchy that there was no nonmalignant blood reduction in the or platelets in the exposures of 25 that several studies slightly slight changes could result from and perhaps below attempt to make these studies of 1 nonmalignant diseases of 10 ppm that because of the linkage between and blood abnormalities to construct a definite time.³² OSHA did the studies demonstrate 10 ppm exposure ensure that no significant nonmalignant blood benzene exposure "tomary" to set a by applying a safety lowest level at which been observed, the evidence supports limit should be set

32. As OSHA itself, malities caused by have any discernible ers may lead to even death. 43 Fed.

33. "A dose-response ship between different risk of cancer [or] with those exposed sure to higher level risk, and exposure nized by a reduced 24.

OSHA's commercial efficiency of the data the lack of data at did not discuss whether a rough estimate, epidemiological or higher exposure levels the risks attributable discuss whether it

The evidence in the administrative record of adverse effects of benzene exposure at 10 ppm is sketchy at best. OSHA noted that there was "no dispute" that certain nonmalignant blood disorders, evidenced by a reduction in the level of red or white cells or platelets in the blood, could result from exposures of 25-40 ppm. It then stated that several studies had indicated that relatively slight changes in normal blood values could result from exposures below 25 ppm and perhaps below 10 ppm. OSHA did not attempt to make any estimate based on these studies of how significant the risk of nonmalignant disease would be at exposures of 10 ppm or less.³² Rather, it stated that because of the lack of data concerning the linkage between low-level exposures and blood abnormalities, it was impossible to construct a dose-response curve at this time.³³ OSHA did conclude, however, that the studies demonstrated that the current 10 ppm exposure limit was inadequate to ensure that no single worker would suffer a nonmalignant blood disorder as a result of benzene exposure. Noting that it is "customary" to set a permissible exposure limit by applying a safety factor of 10-100 to the lowest level at which adverse effects had been observed, the Agency stated that the evidence supported the conclusion that the limit should be set at a point "substantially

less than 10 ppm" even if benzene's leukemic effects were not considered. 43 Fed. Reg., at 5924-5925. OSHA did not state, however, that the nonmalignant effects of benzene exposure justified a reduction in the permissible exposure limit to 1 ppm.³⁴

OSHA also noted some studies indicating an increase in chromosomal aberrations in workers chronically exposed to concentrations of benzene "probably less than 25 ppm."³⁵ However, the Agency took no definitive position as to what these aberrations meant in terms of demonstrable health effects and stated that no quantitative dose-response relationship had yet been established. Under these circumstances, chromosomal effects were categorized by OSHA as an "adverse biological event of serious concern which may pose or reflect a potential health risk and as such, must be considered in the larger purview of adverse health effects associated with benzene." 43 Fed. Reg., at 5932-5934.

With respect to leukemia, evidence of an increased risk (i. e., a risk greater than that borne by the general population) due to benzene exposures at or below 10 ppm was even sketchier. Once OSHA acknowledged that the NIOSH study it had relied upon in promulgating the emergency standard did

from such estimates to derive a risk estimate for low-level exposures.

32. As OSHA itself noted, some blood abnormalities caused by benzene exposure may not have any discernible health effects, while others may lead to significant impairment and even death. 43 Fed. Reg., at 5921.

33. "A dose-response curve shows the relationship between different exposure levels and the risk of cancer [or any other disease] associated with those exposure levels. Generally, exposure to higher levels carries with it a higher risk, and exposure to lower levels is accompanied by a reduced risk." 581 F.2d, at 504, n. 24.

OSHA's comments with respect to the insufficiency of the data were addressed primarily to the lack of data at low exposure levels. OSHA did not discuss whether it was possible to make a rough estimate, based on the more complete epidemiological and animal studies done at higher exposure levels, of the significance of the risks attributable to those levels, nor did it discuss whether it was possible to extrapolate

34. OSHA did not invoke the automatic rule of reducing exposures to the lowest limit feasible that it applies to cancer risks. Instead, the Secretary reasoned that prudent health policy merely required that the permissible exposure limit be set "sufficiently below the levels at which adverse effects have been observed to assure adequate protection for all exposed employees." 43 Fed. Reg., at 5925. While OSHA concluded that application of this rule would lead to an exposure limit "substantially less than 10 ppm," it did not state either what exposure level it considered to present a significant risk of harm or what safety factor should be applied to that level to establish a permissible exposure limit.

35. While citing these studies, OSHA also noted that other studies of similarly exposed workers had not indicated any increased level of chromosome damage.

not support its earlier view that benzene had been shown to cause leukemia at concentrations below 25 ppm, see n. 12, *supra*, there was only one study that provided any evidence of such an increased risk. That study, conducted by the Dow Chemical Co., uncovered three leukemia deaths, versus 0.2 expected deaths, out of a population of 594 workers; it appeared that the three workers had never been exposed to more than 2 to 9 ppm of benzene. The authors of the study, however, concluded that it could not be viewed as proof of a relationship between low-level benzene exposure and leukemia because all three workers had probably been occupationally exposed to a number of other potentially carcinogenic chemicals at other points in their careers and because no leukemia deaths had been uncovered among workers who had been exposed to much higher levels of benzene. In its explanation of the permanent standard, OSHA stated that the possibility that these three leukemias had been caused by benzene exposure could not be ruled out and that the study, although not evidence of an increased risk of leukemia at 10 ppm, was therefore "consistent with the findings of many studies that there is an excess leukemia risk among benzene exposed employees." 43 Fed.Reg., at 5928. The Agency made no finding that the Dow study, any other empirical evidence or any opinion testimony demonstrated that exposure to benzene at or below the 10 ppm level had ever in fact caused leukemia. See 581 F.2d, at

5. "The evidence in the record conclusively establishes that benzene is a human carcinogen. The determination of benzene's leukemogenicity is derived from the evaluation of all the evidence in totality and is not based on any one particular study. OSHA recognizes, as indicated above that individual reports vary considerably in quality, and that some investigations have significant methodological deficiencies. While recognizing the strengths and weaknesses in individual studies, OSHA nevertheless concludes that the benzene record as a whole clearly establishes a causal relationship between benzene and leukemia." 43 Fed.Reg., at 5931.

In rejecting these studies, OSHA stated that: "Although the epidemiological method can provide strong evidence of a causal relationship

503, where the Court of Appeals noted that OSHA was "unable to point to any empirical evidence documenting a leukemia risk at 10 ppm."

In the end OSHA's rationale for lowering the permissible exposure limit to 1 ppm was based, not on any finding that leukemia has ever been caused by exposure to 10 ppm of benzene and that it will not be caused by exposure to 1 ppm, but rather on a series of assumptions indicating that some leukemias might result from exposure to 10 ppm and that the number of cases might be reduced by reducing the exposure level to 1 ppm. In reaching that result, the Agency first unequivocally concluded that benzene is a human carcinogen.³⁶ Second, it concluded that industry had failed to prove that there is a safe threshold level of exposure to benzene below which no excess leukemia cases would occur. In reaching this conclusion OSHA rejected industry contentions that certain epidemiological studies indicating no excess risk of leukemia among workers exposed at levels below 10 ppm were sufficient to establish that the threshold level of safe exposure was at or above 10 ppm.³⁷ It also rejected an industry witness' testimony that a dose-response curve could be constructed on the basis of the reported epidemiological studies and that this curve indicated that reducing the permissible exposure limit from 10 to 1 ppm would prevent at most one leukemia and one other cancer death every six years.³⁸

between exposure and disease in the case of positive findings, it is by its very nature relatively crude and an insensitive measure." After noting a number of specific ways in which such studies are often defective, the Agency stated that it is "... OSHA's policy when evaluating negative studies, to hold them to a higher standard of methodological accuracy." 43 Fed.Reg., at 5931-5932. Viewing the industry studies in this light, OSHA concluded that each of them had sufficient methodological defects to make them unreliable indicators of the safety of low-level exposures to benzene.

38. OSHA rejected this testimony in part because it believed the exposure data in the epidemiological studies to be inadequate to formulate a dose-response curve. It also indicated

Third, the Agency's policy with respect to benzene, including that, in the absence of proof of a safe level of exposure, that any level above the current increased risk of cancer is unacceptable. This number of scientists and health specialists who subscribe to the policy, indicating that a susceptible person could get cancer from the

that even if the threshold level is not proved as long as the risk of cancer—the Agency's policy is to select the most protective of the two. Fed.Reg., at 5941.

39. In his dissenting opinion, Justice SHALL states that OSHA is "blindly on some policy" in setting a policy for benzene. He points out that the Agency witnesses the Agency's record it could not rely on the benzene. With Mr. Justice SHALL of the Agency's ratifying the evidence hearing the evidence same policy view it pp. 13-15, *supra*, no clear evidence to the effect that no safe level of exposure exists. OSHA made clear later in its policy, see n. 51, in industry witnesses in each regulation despite its policy which has not yet been formally designed to the effort in each case arguing that there is a clear carcinogen belief 54154-54155.

40. "As stated above, the benzene demonstration of benzene to the industry, though these studies show high exposure levels once the carcinogen has been established, must be considered in light of the fact that considering any other factors, therefore believes

Third, the Agency applied its standard policy with respect to carcinogens,³⁹ concluding that, in the absence of definitive proof of a safe level, it must be assumed that any level above zero presents some increased risk of cancer.⁴⁰ As the Government points out in its brief, there are a number of scientists and public health specialists who subscribe to this view, theorizing that a susceptible person may contract cancer from the absorption of even one

that even if the testimony was accepted—indeed as long as there was any increase in the risk of cancer—the agency was under an obligation to “select the level of exposure which is most protective of exposed employees.” 43 Fed.Reg., at 5941.

39. In his dissenting opinion, Mr. Justice MARSHALL states that the Agency did not rely “blindly on some draconian carcinogen ‘policy’” in setting a permissible exposure limit for benzene. He points to the large number of witnesses the Agency heard and the voluminous record it compiled as evidence that it relied instead on the particular facts concerning benzene. With all due respect, we disagree with Mr. Justice MARSHALL’s interpretation of the Agency’s rationale for its decision. After hearing the evidence, the Agency relied on the same policy view it had stated at the outset, see pp. 13–15, *supra*, namely that, in the absence of clear evidence to the contrary, it must be assumed that no safe level exists for exposure to a carcinogen. The Agency also reached the entirely predictable conclusion that industry had not carried its concededly impossible burden, see n. 41, *infra*, of proving that a safe level of exposure exists for benzene. As the Agency made clear later in its proposed generic cancer policy, see n. 51, *infra*, it felt compelled to allow industry witnesses to go over the same ground in each regulation dealing with a carcinogen, despite its policy view. The generic policy, which has not yet gone into effect, was specifically designed to eliminate this duplication of effort in each case by foreclosing industry from arguing that there is a safe level for the particular carcinogen being regulated. 42 Fed.Reg., 54154–54155.

40. “As stated above, the positive studies on benzene demonstrate the causal relationship of benzene to the induction of leukemia. Although these studies, for the most part involve high exposure levels, it is OSHA’s view that once the carcinogenicity of a substance has been established qualitatively, any exposure must be considered to be attended by risk when considering any given population. OSHA therefore believes that occupational exposure

molecule of a carcinogen like benzene. Brief for Federal Parties, at 18–19.⁴¹

Fourth, the Agency reiterated its view of the Act, stating that it was required by § 6(b)(5) to set the standard either at the level that has been demonstrated to be safe or at the lowest level feasible, whichever is higher. If no safe level is established, as in this case, the Secretary’s interpretation of the statute automatically leads to the selection of an exposure limit that is the lowest feasible.⁴² Because of benzene’s importance

to benzene at low levels poses a carcinogenic risk to workers.” 43 Fed.Reg., at 5932.

41. The so-called “one hit” theory is based on laboratory studies indicating that one molecule of a carcinogen may react in the test tube with one molecule of DNA to produce a mutation. The theory is that, if this occurred in the human body, the mutated molecule could replicate over a period of years and eventually develop into a cancerous tumor. See OSHA’s Proposed Rule on the Identification, Classification and Regulation of Toxic Substances Posing a Potential Carcinogenic Risk, 42 Fed.Reg. 54148, 54165–54167 (Oct. 4, 1977). Industry witnesses challenged this theory, arguing that the presence of several different defense mechanisms in the human body make it unlikely that a person would actually contract cancer as a result of absorbing one carcinogenic molecule. Thus, the molecule might be detoxified before reaching a critical site, damage to a DNA molecule might be repaired, or a mutated DNA molecule might be destroyed by the body’s immunological defenses before it could develop into a cancer. Tr. 2836.

In light of the improbability of a person contracting cancer as a result of a single hit, a number of the scientists testifying on both sides of the issue agreed that every individual probably does have a threshold exposure limit below which he or she will not contract cancer. See, e.g., Tr. 1179–1181. The problem, however, is that individual susceptibility appears to vary greatly and there is at present no way to calculate each and every person’s threshold. Thus, even industry witnesses agreed that if the standard must ensure with absolute certainty that every single worker is protected from any risk of leukemia, only a zero exposure limit would suffice. Tr. 2492, 2830.

42. “There is no doubt that benzene is a carcinogen and must, for the protection and safety of workers, be regulated as such. Given the inability to demonstrate a threshold or establish a safe level, it is appropriate that OSHA prescribe that the permissible exposure to benzene

economy, no one has ever suggested would be feasible to eliminate its use, or to try to limit exposures to the amounts that are omnipresent. Rath Agency selected 1 ppm as a work-exposure level, see n. 14, *supra*, and then held that compliance with that level was technologically feasible and that "the impact of . . . [compliance] would not be such as to threaten the financial stability of the affected firms or the general economy." 43 Fed.Reg., at 5939. It therefore held that 1 ppm was the minimum feasible exposure level within the meaning of (5) of the Act.

7, although the Agency did not re-
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is general agreement that benzene causes leukemia as well as other fatal of the bloodforming organs. In spite of this conclusion, there does not exist an adequate scientific basis for establishing a quantitative dose response relationship between exposure to benzene and the incidence of leukemia and other blood diseases. The uncertainty in both the actual magnitude of deaths and in the theory of extrapolating existing data to the OSHA exposure levels places the estimation of benefits on a shaky basis of scientific knowledge.' While the OSHA estimates the number of cancers

determine the numbers of employees likely to be adversely affected by exposures of 10 ppm, the Court of Appeals held this finding to be unsupported by the record. 581 F.2d, at 503."

It is noteworthy that at no point in its lengthy explanation did the Agency quote or even cite § 3(8) of the Act. It made no finding that any of the provisions of the new standard were "reasonably necessary or appropriate to provide safe or healthful employment and places of employment." Nor did it allude to the possibility that any such finding might have been appropriate.

III

Our resolution of the issues in this case turns, to a large extent, on the meaning of and the relationship between § 3(8), which defines a health and safety standard as a standard that is "reasonably necessary and appropriate to provide safe or healthful employment," and § 6(b)(5), which directs the Secretary in promulgating a health and safety standard for toxic materials to "set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity . . ."

In the Government's view, § 3(8)'s definition of the term "standard" has no legal significance or at best merely requires that a standard not be totally irrational. It

to be prevented is highly uncertain, the evidence indicates that the number may be appreciable. There is general agreement that even in the absence of the ability to establish a 'threshold' or 'safe' level for benzene and other carcinogens, a dose response relationship is likely to exist; that is, exposure to higher doses carries with it a higher risk of cancer, and conversely exposure to lower levels is accompanied by a reduced risk, even though a precise quantitative relationship cannot be established." 43 Fed.Reg., at 5940.

44. The court did, however, hold that the Agency's other conclusions—that there is *some* risk of leukemia at 10 ppm and that the risk would decrease by decreasing the exposure limit to 1 ppm—were supported by substantial evidence. 581 F.2d, at 503.

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takes the position that § 601 requires the Agency to set a standard that either provides absolute assurance of safety for the worker or that reduces exposure to the lowest level feasible. The court interprets "feasible" as meaning practically achievable at a cost that does not impair the viability of the industry. The dissenting representatives, on the other hand, argue that the Court of Appeals misinterpreted the regulation. They hold that the "reasonable" language of § 601 is appropriate and that the feasibility requirement requires the Agency to quantify the costs and the benefits of a regulation and to conclude that they are commensurate.

[4] In our view, it is not possible to decide whether either the proposed standard or the industry is entirely correct. The Commission is clear that § 3(8) does apply to the proposed standards promulgated by the industry and that it requires the SEC to issue a standard, to determine whether the standard is reasonably necessary and appropriate to remedy a significant risk of impairment. Only after the Commission has

45. We cannot accept the argument that the Secretary's action is totally meaningless. The Secretary to promulgate three sets of standards—national consensus standards and temporary standards. The only support given for two of these—national consensus standards and permanent standards—was that they covered hazards not covered by § 6(b), in § 3. While it is true that the "definitions," that fact does not constitute a definition of substantive content. There would be no purpose in promulgating standards in technical terms of the statute. The definitions were ignored, the statutory criteria at all to guide the Secretary in promulgating either national consensus standards or permanent standards. The Secretary's action in dealing with toxic materials is a clear violation of the Act. We may not expect the Secretary to display perfect craftsmanship, but we are entitled to assume that it intends to promulgate the regulations in the section whatsoever to the Secretary's action in promulgating most of his standards.

The structure of the separate describing emergency temporal

takes the position that § 6(b)(5) is controlling and that it requires OSHA to promulgate a standard that either gives an absolute assurance of safety for each and every worker or that reduces exposures to the lowest level feasible. The Government interprets "feasible" as meaning technologically achievable at a cost that would not impair the viability of the industries subject to the regulation. The respondent industry representatives, on the other hand, argue that the Court of Appeals was correct in holding that the "reasonably necessary and appropriate" language of § 3(8), along with the feasibility requirement of § 6(b)(5), requires the Agency to quantify both the costs and the benefits of a proposed rule and to conclude that they are roughly commensurate.

[4] In our view, it is not necessary to decide whether either the Government or industry is entirely correct. For we think it is clear that § 3(8) does apply to all permanent standards promulgated under the Act and that it requires the Secretary, before issuing any standard, to determine that it is reasonably necessary and appropriate to remedy a significant risk of material health impairment. Only after the Secretary has

made the threshold determination that such a risk exists with respect to a toxic substance, would it be necessary to decide whether § 6(b)(5) requires him to select the most protective standard he can consistent with economic and technological feasibility, or whether, as respondents argue, the benefits of the regulation must be commensurate with the costs of its implementation. Because the Secretary did not make the required threshold finding in this case, we have no occasion to determine whether costs must be weighed against benefits in an appropriate case.

A

Under the Government's view, § 3(8), if it has any substantive content at all,⁴⁵ merely requires OSHA to issue standards that are reasonably calculated to produce a safer or more healthy work environment. Tr. of Oral Arg. 18, 20. Apart from this minimal requirement of rationality, the Government argues that § 3(8) imposes no limits on the Agency's power, and thus would not prevent it from requiring employers to do whatever would be "reasonably necessary" to eliminate all risks of any harm from their workplaces.⁴⁶ With respect to toxic

45. We cannot accept the argument that § 3(8) is totally meaningless. The Act authorized the Secretary to promulgate three different kinds of standards—national consensus standards, permanent standards and temporary emergency standards. The only substantive criteria given for two of these—national consensus standards and permanent standards for safety hazards not covered by § 6(b)(5)—are set forth in § 3. While it is true that § 3 is entitled "definitions," that fact does not drain each definition of substantive content. For otherwise, there would be no purpose in defining the critical terms of the statute. Moreover, if the definitions were ignored, there would be no statutory criteria at all to guide the Secretary in promulgating either national consensus standards or permanent standards other than those dealing with toxic materials and harmful physical agents. We may not expect Congress to display perfect craftsmanship, but it is unrealistic to assume that it intended to give no direction whatsoever to the Secretary in promulgating most of his standards.

The structure of the separate subsection describing emergency temporary standards, 29

U.S.C. § 655(c), quoted *supra*, n. 13, supports this conclusion. It authorizes the Secretary to bypass the normal procedures for setting permanent standards if he makes two findings: (A) that employees are exposed to "grave danger" from exposure to toxic substances and (B) that an emergency standard is "necessary" to protect the employees from that danger. Those findings are to be compared with those that are implicitly required by the definition of the permanent standard—(A) that there be a significant—as opposed to a "grave"—risk, and (B) that additional regulation is "reasonably necessary or appropriate"—as opposed to "necessary." It would be anomalous for Congress to require specific findings for temporary standards but to give the Secretary a *carte blanche* for permanent standards.

46. The Government does not concede that the feasibility requirement in the second sentence of § 6(b)(5) applies to health and safety standards other than toxic substances standards. See n. 1, *supra*. However, even if it did the Government's interpretation of the term "feasible," when coupled with its view of § 3(8),

substances and harmful physical agents, the Government takes an even more extreme position. Relying on § 6(b)(5)'s direction to set a standard "which most adequately assures . . . that no employee will suffer material impairment of health or functional capacity," the Government contends that the Secretary is required to impose standards that either guarantee workplaces that are free from any risk of material health impairment, however small, or that come as close as possible to doing so without ruining entire industries.

[5] If the purpose of the statute were to eliminate completely and with absolute certainty any risk of serious harm, we would agree that it would be proper for the Secretary to interpret §§ 3(8) and 6(b)(5) in this fashion. But we think it is clear that the statute was not designed to require employers to provide absolutely risk-free workplaces whenever it is technologically feasible to do so, so long as the cost is not great enough to destroy an entire industry. Rather, both the language and structure of the Act, as well as its legislative history, indicate that it was intended to require the elimination, as far as feasible, of significant risks of harm.

B

[6] By empowering the Secretary to promulgate standards that are "reasonably necessary or appropriate to provide safe or healthful employment and places of employment," the Act implies that, before promulgating any standard, the Secretary must make a finding that the workplaces in question are not safe. But "safe" is not the equivalent of "risk-free." There are many

would still allow the Agency to require the elimination of even insignificant risks at great cost, so long as an entire industry's viability would not be jeopardized.

47. Section 6(b)(5) parallels § 6(a) in this respect. Section 6(a) requires the Secretary, when faced with a choice between two national consensus standards, to choose the more protective standard, see note 7, *supra*. Just as § 6(a) does not suggest that this more protective standard need not meet the definition of a

activities that we engage in every day—such as driving a car or even breathing city air—that entail some risk of accident or material health impairment; nevertheless, few people would consider these activities "unsafe." Similarly, a workplace can hardly be considered "unsafe" unless it threatens the workers with a significant risk of harm.

[7, 8] Therefore, before he can promulgate any permanent health or safety standard, the Secretary is required to make a threshold finding that a place of employment is unsafe—in the sense that significant risks are present and can be eliminated or lessened by a change in practices. This requirement applies to permanent standards promulgated pursuant to § 6(b)(5), as well as to other types of permanent standards. For there is no reason why § 3(8)'s definition of a standard should not be deemed incorporated by reference into § 6(b)(5). The standards promulgated pursuant to § 6(b)(5) are just one species of the genus of standards governed by the basic requirement. That section repeatedly uses the term "standard" without suggesting any exception from, or qualification of, the general definition; on the contrary, its directs the Secretary to select "the standard"—that is to say, one of various possible alternatives that satisfy the basic definition in § 3(8)—that is most protective.⁴⁷ Moreover, requiring the Secretary to make a threshold finding of significant risk is consistent with the scope of the regulatory power granted to him by § 6(b)(5), which empowers the Secretary to promulgate standards, not for chemicals and physical agents generally, but for "toxic chemicals" and "harmful physical agents."⁴⁸

national consensus standard set forth in § 3(9), so § 6(b)(5) does not suggest that the most protective toxic material standard need not conform to the definition of a "standard" in § 3(8).

48. The rest of § 6(b)(5), while requiring the Secretary to promulgate the standard that "most adequately assures . . . that no employee will suffer material impairment of health or functional capacity," also contains phrases implying that the Secretary should

This interpretation is supported by the Act. Thus, for example, that

"In determining the standard, the Secretary shall consider the urgency of the problem and health standards, trades, crafts, and workplaces."

The Government has argued that this section requires the Secretary to undertake his analysis before he promulgates a standard requiring the elimination of serious hazards. First, the standard must precede the promulgation of the standard, it seems manifest, at a bare minimum, the Secretary must find a significant risk of harm before a probable benefit before establishing the standard.

Section 6(b)(8) requires the Secretary to consider the difference between the standard and the actual risks. Thus, the standard must be "most adequate, feasible, on the basis of the best available science," that no standard is also required to be "research, demonstration, and to consider" the highest degree of protection for the employee, the available scientific data, and the cost of the standard under this and other factors.

Mr. Justice MARSHALL, in his dissenting opinion, would find § 3(8) would not be rendered superfluous by the sentence of § 6(b)(5) if the Secretary is also directed to "research, demonstrate, and to consider" the highest degree of protection for the employee, the available scientific data, and the cost of the standard under this and other factors.

Mr. Justice MARSHALL, in his dissenting opinion, would find § 3(8) would not be rendered superfluous by the sentence of § 6(b)(5) if the Secretary is also directed to "research, demonstrate, and to consider" the highest degree of protection for the employee, the available scientific data, and the cost of the standard under this and other factors.

This interpretation of §§ 3(8) and 6(b)(5) is supported by the other provisions of the Act. Thus, for example, § 6(g) provides in part that

"In determining the priority for establishing standards under this section, the Secretary shall give due regard to the urgency of the need for mandatory safety and health standards for particular industries, trades, crafts, occupations, businesses, workplaces or work environments."

The Government has expressly acknowledged that this section requires the Secretary to undertake some cost-benefit analysis before he promulgates any standard, requiring the elimination of the most serious hazards first.⁴⁹ If such an analysis must precede the promulgation of any standard, it seems manifest that Congress intended, at a bare minimum, that the Secretary find a significant risk of harm and therefore a probability of significant benefits before establishing a new standard.

Section 6(b)(8) lends additional support to this analysis. That subsection requires that, when the Secretary substantially al-

consider differences in degrees of significance rather than simply a total elimination of all risks. Thus, the standard to be selected is one that "most adequately assures, to the extent feasible, on the basis of the best available evidence," that no such harm will result. The Secretary is also directed to take into account "research, demonstrations, experiments and such other information as may be appropriate" and to consider "[i]n addition to the attainment of the highest degree of health and safety protection for the employee the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws."

Mr. Justice MARSHALL states that our view of § 3(8) would make the first sentence in § 6(b)(5) superfluous. We disagree. The first sentence of § 6(b)(5) requires the Secretary to select a highly protective standard once he has determined that a standard should be promulgated. The threshold finding that there is a need for such a standard in the sense that there is a significant risk in the workplace is not unlike the threshold finding that a chemical is toxic or a physical agent is harmful. Once the Secretary has made the requisite threshold finding, § 6(b)(5) directs him to choose the most protective standard that still meets the

ters an existing consensus standard, he must explain how the new rule will "better effectuate" the purposes of the Act.⁵⁰ If this requirement was intended to be more than a meaningless formality, it must be read to impose upon the Secretary the duty to find that an existing national consensus standard is not adequate to protect workers from a continuing and significant risk of harm. Thus, in this case, the Secretary was required to find that exposures at the current permissible exposure level of 10 ppm present a significant risk of harm in the workplace.

In the absence of a clear mandate in the Act, it is unreasonable to assume that Congress intended to give the Secretary the unprecedented power over American industry that would result from the Government's view of §§ 3(8) and 6(b)(5), coupled with OSHA's cancer policy. Expert testimony that a substance is probably a human carcinogen—either because it has caused cancer in animals or because individuals have contracted cancer following extremely high exposures—would justify the conclu-

definition of a standard under § 3(8), consistent with feasibility.

49. "First, 29 U.S.C. § 655(g) requires the Secretary to establish priorities in setting occupational health and safety standards so that the more serious hazards are addressed first. In setting such priorities the Secretary must, of course, consider the relative costs, benefits and risks." Reply Brief, at 13. The Government argues that the Secretary's setting of priorities under this section is not subject to judicial review. Tr. of Oral Arg. 23. While we agree that a court cannot tell the Secretary which of two admittedly significant risks he should act to regulate first, this section, along with §§ 3(8) and 6(b)(5), indicates that the Act does limit the Secretary's power to requiring the elimination of significant risks.

50. Section 6(b)(8), 29 U.S.C. § 655(b)(8), provides:

"Whenever a rule promulgated by the Secretary differs substantially from an existing national consensus standard, the Secretary shall, at the same time, publish in the Federal Register a statement of the reasons why the rule as adopted will better effectuate the purposes of this chapter than the national consensus standard."

sion that the substance poses some risk of serious harm no matter how minute the exposure and no matter how many experts testified that they regarded the risk as insignificant. That conclusion would in turn justify pervasive regulation limited only by the constraint of feasibility. In light of the fact that there are literally thousands of substances used in the workplace that have been identified as carcinogens or suspect carcinogens, the Government's theory would give OSHA power to impose enormous costs that might produce little, if any, discernible benefit.⁵¹

If the Government was correct in arguing that neither § 3(8) nor § 6(b)(5) requires that the risk from a toxic substance be quantified sufficiently to enable the Secretary to characterize it as significant in an understandable way, the statute would make such a "sweeping delegation of legislative power" that it might be unconstitutional under the Court's reasoning in *Schechter Poultry Corp. v. United States*, 295 U.S. 495, 539, 55 S.Ct. 837, 847, 79 L.Ed. 1570, and *Panama Refining Co. v. Ryan*, 293 U.S. 388, 55 S.Ct. 241, 79 L.Ed. 446. A construction of the statute that avoids this kind of open-ended grant should certainly be favored.

C

[9] The legislative history also supports the conclusion that Congress was concerned, not with absolute safety, but with the elimination of significant harm. The examples of industrial hazards referred to in the committee hearings and debates all involved

51. OSHA's proposed generic cancer policy, 42 Fed.Reg. 54148 (Oct. 4, 1977), indicates that this possibility is not merely hypothetical. Under its proposal, whenever there is a certain quantum of proof—either from animal experiments, or, less frequently, from epidemiological studies—that a substance causes cancer at any exposure level, an emergency temporary standard would be promulgated immediately, requiring employers to provide monitoring and medical examinations and to reduce exposures to the lowest feasible level. A proposed rule would then be issued along the same lines, with objecting employers effectively foreclosed from

situations in which the risk was unquestionably significant. For example, the Senate Committee on Labor and Public Welfare noted that byssinosis, a disabling lung disease caused by breathing cotton dust, affected as many as 30% of the workers in carding or spinning rooms in some American cotton mills and that as many as 100,000 active or retired workers were then suffering from the disease. It also noted that statistics indicated that 20,000 out of 50,000 workers who had performed insulation work were likely to die of asbestosis, lung cancer or mesothelioma as a result of breathing asbestos fibers. Another example given of an occupational health hazard that would be controlled by the Act was betanaphthylamine, a "chemical so toxic that any exposure at all is likely to cause the development of bladder cancer over a period of years." S.Rep.No.91-1282, at 3-4 (91st Cong., 2d Sess.), Legislative History, Occupational Health and Safety Act of 1970, pp. 143-144 (1971) (Comm. Print), U.S. Code Cong. & Admin. News 1970, pp. 5177, 5180.

Moreover, Congress specifically amended § 6(b)(5) to make it perfectly clear that it does not require the Secretary to promulgate standards that would assure an absolutely risk-free workplace. Section 6(b)(5) of the initial Committee bill provided that

"The Secretary in promulgating standards under this subsection, shall set the standard which most adequately and feasibly assures, on the basis of the best available evidence, that no employee will suffer any impairment of health or functional capacity, or diminished life expect-

presenting evidence that there is little or no risk associated with current exposure levels. 42 Fed.Reg. at 54154-54155, 54184.

The scope of the proposed regulation is indicated by the fact that NIOSH has published a list of 2,415 potential occupational carcinogens, NIOSH Suspected Carcinogens: A Subfile of the NIOSH Registry of Toxic Effects of Chemical Substances, HEW Pub. No. 77-149 (Dec. 1976). OSHA has tentatively concluded that 269 of these substances have been proved to be carcinogens and therefore should be subject to full regulation. See OSHA Press Release, USDL 78-625 (July 14, 1978).

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On the floor of the Senate, Senator Dominick questioned the wisdom of this provision, stating

"How in the world are we ever going to live up to that? What are we going to do about a place in Florida where mosquitoes are getting at the employee—perish the thought that there may be mosquitoes in Florida? But there are black flies in Minnesota and Wisconsin. Are we going to say that if employees get bitten by those for the rest of their lives they will not have been done any harm at all? Probably they will not be, but do we know?" Legis.Hist., at 345.

He then offered an amendment deleting the entire subsection.⁵² After discussions with the sponsors of the Committee bill, Senator Dominick revised his amendment. Instead of deleting the first sentence of § 6(b)(5) entirely, his new amendment limited the application of that subsection to toxic materials and harmful physical agents and

52. In criticizing the Committee bill, Senator Dominick also made the following observations:

"It is unrealistic to attempt, as this section apparently does, to establish a utopia free from any hazards. Absolute safety is an impossibility and it will only create confusion in the administration of this act for the Congress to set clearly unattainable goals." Legis.Hist., at 480.

"But I ask, Mr. President, just thinking about that language let us take a fellow who is a streetcar conductor or a bus conductor at the present time. How in the world, in the process of the automobile accidents that we have all during a working day of any one driving a bus or trolley car, or whatever it may be, can we set standards that will make sure he will not have any risk to his life for the rest of his life? It is totally impossible for this to be put in a bill; and yet it is in the committee bill." Legis.Hist., at 423.

As an opponent of the legislation, Senator Dominick may have exaggerated the significance of the problem since the language in § 3(8) already was sufficient to prevent the Secretary from trying "to establish a utopia free from any hazards." Nevertheless, the fact

changed "any" impairment of health to "material" impairment.⁵³ In discussing this change, Senator Dominick noted that the Committee's bill read as if a standard had to "assure that, no matter what anybody was doing, the standard would protect him for the rest of his life against any foreseeable hazard." Such an "unrealistic standard," he stated, had not been intended by the sponsors of the bill. Rather, he explained that the intention of the bill, as implemented by the amendment, was to require the Secretary

to use his best efforts to promulgate the best available standards, and in so doing, he should take into account that anyone working in toxic agents and physical agents which might be harmful may be subjected to such conditions for the rest of his working life, so that we can get at something which might not be toxic now, if he works in it a short time, but if he works in it the rest of his life might be very dangerous; and we want to make sure that such things are taken into consideration in establishing standards." Legis.Hist., at 502-503.⁵⁴

that Congress amended the bill to allay Senator Dominick's concern demonstrates that it did not intend the statute to achieve "clearly unattainable goals."

53. Senator Dominick had also been concerned that the placement of the word "feasibly" could be read to require the Secretary to "ban all occupations in which there remains some risk of injury, impaired health, or life expectancy," since the way to most "adequately" and "feasibly" assure absolute protection might well be to prohibit the occupation entirely. Legis.Hist., at 366-367. In his final amendment, he attempted to cure this problem by relocating the feasibility requirement, changing "the standard which most adequately and feasibly assures" to "the standard which most adequately assures, to the extent feasible."

54. Mr. Justice MARSHALL argues that Congress could not have thought § 3(8) had any substantive meaning inasmuch as § 6(b)(5), as originally drafted, applied to all standards and not simply to standards for toxic materials and harmful physical substances. However, as this legislative history indicates, it appears that the omission of the words "toxic substances" and

Senator Williams, one of the sponsors of the Committee bill, agreed with the interpretation, and the amendment was adopted.

In its reply brief the Government argues that the Dominick amendment simply means that the Secretary is not required to eliminate threats of insignificant harm; it argues that § 6(b)(5) still requires the Secretary to set standards that ensure that not even one employee will be subject to any risk of serious harm—no matter how small that risk may be.⁵⁵ This interpretation is at odds with Congress' express recognition of the futility of trying to make all workplaces totally risk-free. Moreover, not even OSHA follows this interpretation of § 6(b)(5) to its logical conclusion. Thus, if OSHA is correct that the only no-risk level for leukemia due to benzene exposure is zero and if its interpretation of § 6(b)(5) is correct, OSHA should have set the exposure limit as close to zero as feasible. But OSHA did not go about its task in that way. Rather, it began with a 1 ppm level, selected at least in part to ensure that employers would not be required to eliminate benzene concentrations that were little greater than the so-called "background" exposures expe-

rienced by the population at large. See n. 14, *supra*. Then, despite suggestions by some labor unions that it was feasible for at least some industries to reduce exposures to well below 1 ppm,⁵⁶ OSHA decided to apply the same limit to all, largely as a matter of administrative convenience. 43 Fed.Reg., at 5947.

OSHA also deviated from its own interpretation of § 6(b)(5) in adopting an action level of 0.5 ppm below which monitoring and medical examinations are not required. In light of OSHA's cancer policy, it must have assumed that some employees would be at risk because of exposures below 0.5 ppm. These employees would thus presumably benefit from medical examinations, which might uncover any benzene-related problems. OSHA's consultant advised the Agency that it was technologically and economically feasible to require that such examinations be provided. Nevertheless, OSHA adopted an action level, largely because the insignificant benefits of giving such examinations and performing the necessary monitoring did not justify the substantial cost.⁵⁷

"harmful physical agents" from the original draft of § 6(b)(5) was entirely inadvertent. As Senator Dominick noted, the Committee had always intended that subsection to apply only to that limited category of substances. The reason that Congress drafted a special section for these substances was not, as Mr. Justice MARSHALL suggests, because it thought that there was a need for special protection in these areas. Rather, it was because Congress recognized that there were special problems in regulating health risks as opposed to safety risks. In the latter case, the risks are generally immediate and obvious, while in the former, the risks may not be evident until a worker has been exposed for long periods of time to particular substances. It was to ensure that the Secretary took account of these long-term risks that Congress enacted § 6(b)(5).

55. Reply Brief, at 24-26. While it is true that some of Senator Dominick's comments were concerned with the relative unimportance of minor injuries (see his "fly" example quoted at p. 2867, *supra*), it is clear that he was also concerned with the remote possibility of major injuries; see n. 52, *supra*.

56. One union suggested a 0.5 ppm permissible exposure limit for oil refineries and a 1 ppm ceiling (rather than a time-weighted average) exposure for all other industries, with no use of an action level, Tr. 1250, 1257. Another wanted a 1 ppm ceiling limit for all industries, Tr. 3376.

57. "A need for an action level is also suggested by the record evidence that some minimal exposure to benzene occurs naturally from animal and plant matter (Tr. 749-750, 759-760). Naturally occurring benzene concentrations, it appears, may range from 0.02 to 15 parts per billion (Ex. 117, p. 1). Additionally, it was suggested by certain employers that their operations be exempted from the requirements of the standard because those operations involve only intermittent and low level exposures to benzene. The use of the action level concept should accommodate these concerns in all cases where exposures are indeed extremely low since it substantially reduces the monitoring of employees who are below the action level and removes for these employees the requirements for medical surveillance. At the same time, employees with significant overexposure are afforded the full protection of the

OSHA's continuing with using an action level to adopt an interpretation not requiring risks.⁵⁸ It is interpretation requires the in the standard significant risk.

Finally, with history, it is progress repeat about allowing much power. Thus, Congress the power generally because *Whirlpool Co.*, 100 S.Ct. 883, circumscribed temporary enforcement by Congress power is not mere possibility where in the risk of cancer exercise of the expenditure dollars to minimize

standard." (5942.)

58. The Government OSHA's policy wherever possible reasonable protection OSHA's own. In light of the situation and the decline to determine

59. In *Florida Dept. of Labor* (CAS 1974), the court tended to reject standards, which notice or hearing an emergency only a danger from exposure sure necessity *Dry Color M*, 486 F.2d 98,

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OSHA's concessions to practicality in beginning with a 1 ppm exposure limit and using an action level concept implicitly adopt an interpretation of the statute as not requiring regulation of insignificant risks.⁵⁸ It is entirely consistent with this interpretation to hold that the Act also requires the Agency to limit its endeavors in the standard-setting area to eliminating significant risks of harm.

Finally, with respect to the legislative history, it is important to note that Congress repeatedly expressed its concern about allowing the Secretary to have too much power over American industry. Thus, Congress refused to give the Secretary the power to shut down plants unilaterally because of an imminent danger, see *Whirlpool Corp. v. Marshall*, — U.S. —, 100 S.Ct. 883, 63 L.Ed.2d 154, and narrowly circumscribed the Secretary's power to issue temporary emergency standards.⁵⁹ This effort by Congress to limit the Secretary's power is not consistent with a view that the mere possibility that some employee somewhere in the country may confront some risk of cancer is a sufficient basis for the exercise of the Secretary's power to require the expenditure of hundreds of millions of dollars to minimize that risk.

standard" (Emphasis added.) 43 Fed.Reg. at 5942.

58. The Government also states that it is OSHA's policy to attempt to quantify benefits wherever possible. While this is certainly a reasonable position, it is not consistent with OSHA's own view of its duty under § 6(b)(5). In light of the inconsistencies in OSHA's position and the legislative history of the Act, we decline to defer to the Agency's interpretation.

59. In *Florida Peach Growers Assn., Inc. v. Dept. of Labor*, 489 F.2d 120, 130, and n. 16 (CA5 1974), the court noted that Congress intended to restrict the use of emergency standards, which are promulgated without any notice or hearing. It held that, in promulgating an emergency standard, OSHA must find not only a danger of exposure or even some danger from exposure, but a grave danger from exposure necessitating emergency action. Accord, *Dry Color Mfrs. Assn., Inc. v. Dept. of Labor*, 486 F.2d 98, 100 (CA3 1973) (an emergency

Given the conclusion that the Act empowers the Secretary to promulgate health and safety standards only where a significant risk of harm exists, the critical issue becomes how to define and allocate the burden of proving the significance of the risk in a case such as this, where scientific knowledge is imperfect and the precise quantification of risks is therefore impossible. The Agency's position is that there is substantial evidence in the record to support its conclusion that there is no absolutely safe level for a carcinogen and that, therefore, the burden is properly on industry to prove, apparently beyond a shadow of a doubt, that there is a safe level for benzene exposure. The Agency argues that, because of the uncertainties in this area, any other approach would render it helpless, forcing it to wait for the leukemia deaths that it believes are likely to occur⁶⁰ before taking any regulatory action.

We disagree. As we read the statute, the burden was on the Agency to show, on the basis of substantial evidence, that it is at least more likely than not that long-term exposure to 10 ppm of benzene presents a significant risk of material health impairment. Ordinarily, it is the proponent of a rule or order who has the burden of proof in administrative proceedings. See 5 U.S.C.

standard must be supported by something more than a possibility that a substance may cause cancer in man).

Congress also carefully circumscribed the Secretary's enforcement powers by creating a new, independent board to handle appeals from citations issued by the Secretary for noncompliance with health and safety standards. See 29 U.S.C. §§ 659-661.

60. As noted above, OSHA acknowledged that there was no empirical evidence to support the conclusion that there was any risk whatsoever of deaths due to exposures at 10 ppm. What OSHA relied upon was a theory that, because leukemia deaths had occurred at much higher exposures, some (although fewer) were also likely to occur at relatively low exposures. The Court of Appeals specifically held that its conclusion that the number was "likely" to be appreciable was unsupported by the record. See p. 2862, *supra*.

§ 556(d). In some cases involving toxic substances, Congress has shifted the burden of proving that a particular substance is safe onto the party opposing the proposed rule.⁶¹ The fact that Congress did not follow this course in enacting OSHA indicates that it intended the Agency to bear the normal burden of establishing the need for a proposed standard.

In this case OSHA did not even attempt to carry its burden of proof. The closest it came to making a finding that benzene presented a significant risk of harm in the workplace was its statement that the benefits to be derived from lowering the permissible exposure level from 10 to 1 ppm were "likely" to be "appreciable." The Court of Appeals held that this finding was not supported by substantial evidence. Of greater importance, even if it were supported by substantial evidence, such a finding would not be sufficient to satisfy the Agency's obligations under the Act.

The inadequacy of the Agency's findings can perhaps be illustrated best by its rejection of industry testimony that a dose-response curve can be formulated on the basis of current epidemiological evidence and that, even under the most conservative extrapolation theory, current exposure levels would cause at most two deaths out of a population of about 30,000 workers every six years. See n. 38, *supra*. In rejecting this testimony, OSHA made the following statement:

"In the face of the record evidence of numerous actual deaths attributable to benzene-induced leukemia and other fatal blood diseases, OSHA is unwilling to rely on the hypothesis that at most two cancers every six years would be prevented by the proposed standard. By way of example, the Infante study disclosed seven excess leukemia deaths in a population of about 600 people over a 25-year period.

While the Infante study involved higher exposures than those currently encountered, the incidence rates found by Infante, together with the numerous other cases reported in the literature of benzene leukemia and other fatal blood diseases, makes it difficult for OSHA to rely on the [witness] hypothesis to assure that statutorily mandated protection for employees. In any event, due to the fact that there is no safe level of exposure to benzene and that it is impossible to precisely quantify the anticipated benefits, OSHA must select the level of exposure which is most protective of exposed employees." 43 Fed.Reg., at 5941.

There are three possible interpretations of OSHA's stated reason for rejecting the witness' testimony: (1) OSHA considered it probable that a greater number of lives would be saved by lowering the standard from 10 ppm; (2) OSHA thought that saving two lives every six years in a work force of 30,000 persons is a significant savings that makes it reasonable and appropriate to adopt a new standard; or (3) even if the small number is not significant and even if the savings may be even smaller, the Agency nevertheless believed it had a statutory duty to select the level of exposure that is most protective of the exposed employees if it is economically and technologically feasible to do so. Even if the Secretary did not intend to rely entirely on this third theory, his construction of the statute would make it proper for him to do so. Moreover, he made no express findings of fact that would support his 1 ppm standard on any less drastic theory. Under these circumstances, we can hardly agree with the Government that OSHA discharged its duty under the Act.

Contrary to the Government's contentions, imposing a burden on the Agency of demonstrating a significant risk of harm

order to suspend its registration under the Federal Insecticide, Fungicide and Rodenticide Act. The court noted that Congress had deliberately shifted the ordinary burden of proof under the APA, requiring manufacturers to establish the continued safety of their products.

will not strip carcinogens, to wait for any action. "significant" mathematical cy's responsibility, instance, what "cant" risk. S. ble and other for example, that a person a drink of ch ly could not the other ha thousand tha vapors that a fatal, a reas sider the risk ate steps to though the A the exact pro an obligation is present be of employme

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63. Mr. Justi our approach deaths to occ making a br of significan dence. Mr. ever, rests c only reason benefits in t

61. See *Environmental Defense Fund, Inc. v. EPA*, 179 U.S.App.D.C. 43, 548 F.2d 998, 1004, 1012-1018 (1977), cert. denied, 431 U.S. 925, 97 S.Ct. 2199, 53 L.Ed.2d 239, where the court rejected the argument that the EPA has the burden of proving that a pesticide is unsafe in

will not strip it of its ability to regulate carcinogens, nor will it require the Agency to wait for deaths to occur before taking any action. First, the requirement that a "significant" risk be identified is not a mathematical straitjacket. It is the Agency's responsibility to determine, in the first instance, what it considers to be a "significant" risk. Some risks are plainly acceptable and others are plainly unacceptable. If, for example, the odds are one in a billion that a person will die from cancer by taking a drink of chlorinated water, the risk clearly could not be considered significant. On the other hand, if the odds are one in a thousand that regular inhalation of gasoline vapors that are two percent benzene will be fatal, a reasonable person might well consider the risk significant and take appropriate steps to decrease or eliminate it. Although the Agency has no duty to calculate the exact probability of harm, it does have an obligation to find that a significant risk is present before it can characterize a place of employment as "unsafe."⁶²

Second, OSHA is not required to support its finding that a significant risk exists with anything approaching scientific certainty.

62. In his dissenting opinion, *post*, at 2896, Mr. Justice MARSHALL states that "when the question involves determination of the acceptable level of risk, the ultimate decision must necessarily be based on considerations of policy as well as empirically verifiable facts. Factual determinations can at most define the risk in some statistical way; the judgment whether that risk is tolerable cannot be based solely on a resolution of the facts." We agree. Thus, while the Agency must support its finding that a certain level of risk exists by substantial evidence, we recognize that its determination that a particular level of risk is "significant" will be based largely on policy considerations. At this point we have no need to reach the issue of what level of scrutiny a reviewing court should apply to the latter type of determination.

63. Mr. Justice MARSHALL states that, under our approach, the agency must either wait for deaths to occur or must "deceive the public" by making a basically meaningless determination of significance based on totally inadequate evidence. Mr. Justice MARSHALL's view, however, rests on the erroneous premise that the only reason OSHA did not attempt to quantify benefits in this case was because it could not

Although the Agency's findings must be supported by substantial evidence, 29 U.S.C. § 655(f), § 6(b)(5) specifically allows the Secretary to regulate on the basis of the "best available evidence." As several courts of appeals have held, this provision requires a reviewing court to give OSHA some leeway where its findings must be made on the frontiers of scientific knowledge. See *Industrial Union Dept., AFL-CIO v. Hodgson*, 162 U.S.App.D.C. 331, 340, 499 F.2d 467, 476 (1974); *Society of the Plastics Industry, Inc. v. OSHA*, 509 F.2d 1301, 1308 (CA2 1975), cert. denied, 421 U.S. 992, 95 S.Ct. 1998, 44 L.Ed.2d 482. Thus, so long as they are supported by a body of reputable scientific thought, the Agency is free to use conservative assumptions in interpreting the data with respect to carcinogens, risking error on the side of over-protection rather than under-protection.⁶³

Finally, the record in this case and OSHA's own rulings on other carcinogens indicate that there are a number of ways in which the Agency can make a rational judgment about the relative significance of the risks associated with exposure to a particular carcinogen.⁶⁴

do so in any reasonable manner. As the discussion of the Agency's rejection of an industry attempt at formulating a dose-response curve demonstrates, however, see pp. 2869-2870 *supra*, the Agency's rejection of methods such as dose-response curves was based at least in part on its view that nothing less than absolute safety would suffice.

64. For example, in the coke oven emissions standard, OSHA had calculated that 21,000 exposed coke oven workers had an annual excess mortality of over 200 and that the proposed standard might well eliminate the risk entirely. 41 Fed.Reg. 46742, 46750 (Oct. 22, 1976), upheld in *American Iron & Steel Inst. v. OSHA*, 577 F.2d 825 (CA3 1978), cert. pending, No. 78-919. In hearings on the coke oven emissions standard the Council on Wage and Price Stability estimated that 8 to 35 lives would be saved each year, out of an estimated population of 14,000 workers, as a result of the proposed standard. Although noting that the range of benefits would vary depending on the assumptions used, OSHA did not make a finding as to whether its own staff estimate or CWPS's was correct, on the ground that it was not required to quantify the expected benefits of the stan-

It should also be noted that, in setting a permissible exposure level in reliance on less-than-perfect methods, OSHA would have the benefit of a backstop in the form of monitoring and medical testing. Thus, if OSHA properly determined that the permissible exposure limit should be set at 5 ppm, it could still require monitoring and medical testing for employees exposed to lower levels.⁶⁵ By doing so, it could keep a constant check on the validity of the assumptions made in developing the permissible exposure limit, giving it a sound evidentiary basis for decreasing the limit if it was initially set too high.⁶⁶ Moreover, in this way it could ensure that workers who were unusually susceptible to benzene could be removed from exposure before they had suffered any permanent damage.⁶⁷

dard or to weigh those benefits against the projected costs.

In other proceedings, the Agency has had a good deal of data from animal experiments on which it could base a conclusion on the significance of the risk. For example, the record on the vinyl chloride standard indicated that a significant number of animals had developed tumors of the liver, lung and skin when they were exposed to 50 ppm of vinyl chloride over a period of 11 months. One hundred out of 200 animals died during that period. 39 Fed.Reg. 35890, 35891 (Oct. 4, 1977). Similarly, in a 1974 standard regulating 14 carcinogens, OSHA found that one of the substances had caused lung cancer in mice or rats at 1 ppm and even 0.1 ppm, while another had caused tumors in 80% of the animals subjected to high doses. 39 Fed.Reg. 3756, 3757 (Jan. 29, 1974), upheld in *Synthetic Organic Chemical Mfrs. Assn. v. Brennan*, 503 F.2d 1155 (CA3 1974), cert. denied, 420 U.S. 973, 95 S.Ct. 1396, 43 L.Ed.2d 653, and 506 F.2d 385 (CA3-1974), cert. denied, 423 U.S. 830, 96 S.Ct. 50, 46 L.Ed.2d 48.

In this case the Agency did not have the benefit of animal studies, because scientists have been unable as yet to induce leukemia in experimental animals as a result of benzene exposure. It did, however, have a fair amount of epidemiological evidence, including both positive and negative studies. Although the Agency stated that this evidence was insufficient to construct a precise correlation between exposure levels and cancer risks, it would at least be helpful in determining whether it is more likely than not that there is a significant risk at 10 ppm.

E

Because our review of this case has involved a more detailed examination of the record than is customary, it must be emphasized that we have neither made any factual determinations of our own, nor have we rejected any factual findings made by the Secretary. We express no opinion on what factual findings this record might support, either on the basis of empirical evidence or on the basis of expert testimony; nor do we express any opinion on the more difficult question of what factual determinations would warrant a conclusion that significant risks are present which make promulgation of a new standard reasonably necessary or appropriate. The standard must, of course, be supported by the findings actually made by the Secretary, not merely by findings that we believe he might have made.

65. See *GAF Corp. v. OSHRC*, 183 U.S.App.D.C. 20, 561 F.2d 913 (1977), where the Court upheld the asbestos standard insofar as it required employers to provide medical examinations for employees exposed to any asbestos fibers, even if they were exposed to concentrations below the permissible exposure limit.

The respondent industry representatives have never disputed OSHA's power to require monitoring and medical examinations in general, although they did object to some of the specific requirements imposed in this case. See n. 30, *supra*. Because of our disposition of the case, we have no occasion to pass on these specific objections or to determine what cost-benefit considerations, if any, should govern the Agency's imposition of such requirements.

66. This is precisely the type of information-gathering function that Congress had in mind when it enacted § 6(b)(7), which empowers the Secretary to require medical examinations to be furnished to employees exposed to certain hazards and potential hazards "in order to most effectively determine whether the health of such employees is adversely affected by such exposure." See *Legis.Hist.*, p. 147.

67. In its explanation of the final standard OSHA noted that there was some testimony that blood abnormalities would disappear after exposure had ceased. 43 Fed.Reg. 5946. Again, however, OSHA refused to rely on the hypothesis that this would always occur. Yet, in requiring medical examinations of employees exposed to between 0.5 ppm and 1 ppm, OSHA was essentially providing itself with the same kind of backstop.

[10] In this perfectly clear squarely on a s that imposed proving the e exposure, there threshold respo need for more interpreting h Secretary exce

Throughout ings, the derm tively little at OSHA recom and eye conta basis of its p carcinogen, al (i. e., inhalati tion) [should] ble." 43 Fe little oppositi hearing on t because the from both t and the derm involving lic (and after o

In its fin eliminated t uid benzene, no predictat centage of l borne expos *supra*.⁴³ Alth benzene is concededly exempt an benzene th dermal con it stated t "suggest tl on the am liquid."⁴⁴

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[10] In this case the record makes it perfectly clear that the Secretary relied squarely on a special policy for carcinogens that imposed the burden on industry of proving the existence of a safe level of exposure, thereby avoiding the Secretary's threshold responsibility of establishing the need for more stringent standards. In so interpreting his statutory authority, the Secretary exceeded his power.

IV

Throughout the administrative proceedings, the dermal contact issue received relatively little attention. In its proposed rule OSHA recommended a total ban on skin and eye contact with liquid benzene on the basis of its policy that "in dealing with a carcinogen, all potential routes of exposure (i. e., inhalation, ingestion, and skin absorption) [should] be limited to the extent feasible." 43 Fed.Reg., at 5948. There was little opposition to this requirement at the hearing on the proposed rule, apparently because the proposed rule also excluded from both the permissible exposure level and the dermal contact ban work operations involving liquid mixtures containing 1% (and after one year, 0.1%) or less benzene.

In its final standard, however, OSHA eliminated the percentage exclusion for liquid benzene, on the ground that there was no predictable correlation between the percentage of benzene in a liquid and the airborne exposure arising from it. See n. 18, *supra*. Although the extent to which liquid benzene is absorbed through the skin is concededly unknown, OSHA also refused to exempt any liquids, no matter how little benzene they contained, from the ban on dermal contact. In support of this position it stated that there was no evidence to "suggest that the absorption rate depends on the amount of benzene present in the liquid." 43 Fed.Reg., at 5948-5949.

After the permanent standard was promulgated, OSHA received a number of requests from various industries that the percentage exclusion for liquids containing small amounts of benzene be reinstated.

Those concerned with airborne exposures argued that they should not be required to monitor workplaces simply because they handled petroleum-based products in which benzene is an unavoidable contaminant. Others concerned with the dermal contact ban made similar arguments. In particular, tire manufacturers argued that it was impossible for them to comply with the ban because gloves cannot be worn during certain tire-building operations in which solvents are used and solvents containing absolutely no benzene are not commercially available.

Because of these requests, OSHA held a new series of hearings and promulgated an amendment to the rule, reinstating the percentage exclusion, but lowering it from the proposed 1% to 0.5%. The Agency did, however, provide for a three-year grace period before the exclusion dropped to 0.1%, rather than the one year that had originally been proposed. In explaining its amendment, OSHA reiterated its policy with respect to carcinogens, stating that, because there is no absolutely safe level for any type of exposure, exposures by whatever route must be limited to the extent feasible. For airborne exposures, a zero permissible exposure limit had not been feasible. However, in most industries a ban on any dermal contact was feasible since compliance could be achieved simply by the use of protective clothing, such as impermeable gloves. The Agency recognized that the dermal contact ban could present a problem for tire manufacturers, but stated that the percentage exclusion would alleviate the problem, because solvents containing 0.5% or less benzene were available in sufficient quantities. Although it noted that solvents containing 0.1% or less benzene were not then available in quantity, the Agency stated that a three-year grace period would be sufficient to "allow time for increased production of solvents containing lower amounts of benzene and for development and evaluation of alternative methods of compliance with the standard's dermal provision." 43 Fed.Reg., at 27968-27969.

The Court of Appeals struck down the dermal contact prohibition on two grounds. First, it held that the record did not support a finding that the ban would result in quantifiable benefits in terms of a reduced leukemia risk; therefore, it was not "reasonably necessary" within the meaning of § 3(8) of the Act. Second, the court held that the Agency's conclusion that benzene may be absorbed through the skin was not based on the best available evidence as required by § 6(b)(5). 581 F.2d, at 505-506. On the second ground, the court noted that the evidence on the issue of absorption of benzene through the skin was equivocal, with some studies indicating that it could be absorbed and some indicating that it could not. All of these studies were relatively old and the only expert who had testified on the issue stated that a simple test was now available to determine, with a great deal of accuracy, whether and to what extent absorption will result. In light of § 6(b)(5), which requires the Agency to promulgate standards on the basis of the "best available evidence" and "the latest available scientific data in the field," the court held that where there is uncontradicted testimony that a simple test will resolve the issue, the Agency is required to acquire that information before "promulgating regulations which would require an established industry to change long-followed work processes that are not demonstrably unsafe." 581 F.2d, at 508.

While the court below may have been correct in holding that, under the peculiar circumstances of this case, OSHA was required to obtain more information, there is no need for us to reach that issue. For, in order to justify a ban on dermal contact, the Agency must find that such a ban is "reasonably necessary and appropriate" to remove a significant risk of harm from such contact. The Agency did not make such a finding, but rather acted on the basis of the absolute, no-risk policy that it applies to carcinogens. Indeed, on this issue the Agency's position is even more untenable, inasmuch as it was required to assume not only that benzene in small doses is a carci-

nogen, but also that it can be absorbed through the skin in sufficient amounts to present a carcinogenic risk. These assumptions are not a proper substitute for the findings of a significant risk of harm required by the Act.

The judgment of the Court of Appeals remanding the petition for review to the Secretary for further proceedings is affirmed.

It is so ordered.

Mr. Chief Justice BURGER, concurring.

This case presses upon the Court difficult unanswered questions on the frontiers of science and medicine. The statute and the legislative history give ambiguous signals as to how the Secretary is directed to operate in this area. The opinion by Mr. Justice STEVENS takes on a difficult task to decode the message of the statute as to guidelines for administrative action.

To comply with statutory requirements, the Secretary must bear the burden of "finding" that a proposed health and safety standard is "reasonably necessary or appropriate to provide safe or healthful employment and places of employment." This policy judgment entails the subsidiary finding that the pre-existing standard presents a "significant risk" of material health impairment for a worker who spends his entire employment life in a working environment where exposure remains at maximum permissible levels. The Secretary's factual finding of "risk" must be "quantified sufficiently to enable the Secretary to characterize it as significant in an understandable way." *Ante*, at 2866. Precisely what this means is difficult to say. But because these mandated findings were not made by the Secretary, I agree that the 1 ppm benzene standard must be invalidated. However, I would stress the differing functions of the courts and the administrative agency with respect to such health and safety regulation.

The Congress is the ultimate regulator and the narrow function of the courts is to

discern the meaning of the statute in implementing regulatory of ensuring health and safety "has given reason of the pertinent facts with statutory Area Rate Case 1344, 1373, 20 holding that the steps with great not to be taken of legitimate age facts and arguments and duly considered make a policy judgment specific risk of health can't in terms of the statute. When he pursuant to the legislation by Congressatives of the legislative one aspect of a promulgate regulations appear as imprudent allocation of resources does not extend of regulatory policy elsewhere—in Congress oversight or amendment though to be sure ill defined and ind

Nevertheless, we under the statute admonished to responsibility burdened in this statute refrain from regulating *de minimis* risks. v. EPA, — U.S. —, No. 78-1006

1. These portions primarily address OSHA, rather than OSHA made evidentiary findings I agree with every opinion concerning such findings. I question whether the statute would doctrine of *Schechter Poultry Corp. v. United States*, 295 U.S. 49

discern the meaning of the statute and the implementing regulations with the objective of ensuring that in promulgating health and safety standards the Secretary "has given reasoned consideration to each of the pertinent factors" and has complied with statutory commands. *Permian Basin Area Rate Cases*, 390 U.S. 747, 792, 88 S.Ct. 1344, 1373, 20 L.Ed.2d 312 (1968). Our holding that the Secretary must retrace his steps with greater care and consideration is not to be taken in derogation of the scope of legitimate agency discretion. When the facts and arguments have been presented and duly considered, the Secretary must make a policy judgment as to whether a specific risk of health impairment is significant in terms of the policy objectives of the statute. When he acts in this capacity, pursuant to the legislative authority delegated by Congress, he exercises the prerogatives of the legislature—to focus on only one aspect of a larger problem, or to promulgate regulations that, to some, may appear as imprudent policy or inefficient allocation of resources. The judicial function does not extend to substantive revision of regulatory policy. That function lies elsewhere—in Congressional and Executive oversight or amendatory legislation; although to be sure the boundaries are often ill defined and indistinct.

Nevertheless, when discharging his duties under the statute, the Secretary is well admonished to remember that a heavy responsibility burdens his authority. Inherent in this statutory scheme is authority to refrain from regulation of insignificant or *de minimis* risks. See *Alabama Power Co. v. EPA*, — U.S.App.D.C. —, — F.2d —, No. 78-1006, Slip op., at 41-44 (Dec.

14, 1979) (opinion of Leventhal, J.). When the administrative record reveals only scant or minimal risk of material health impairment, responsible administration calls for avoidance of extravagant, comprehensive regulation. Perfect safety is a chimera; regulation must not strangle human activity in the search for the impossible.

Mr. Justice POWELL, concurring in part and in the judgment.

I join Parts I, II, III A-C, and III-E of the plurality opinion.¹ The Occupational Safety and Health Agency relied in large part on its "carcinogen policy"—which had not been adopted formally—in promulgating the benzene exposure and dermal contact regulation at issue of this case.² For the reasons stated by the plurality, I agree that §§ 6(b)(5) and 3(8) of the Occupational Safety and Health Act of 1970, 29 U.S.C. §§ 655(b)(5), 652(8), must be read together. They require OSHA to make a threshold finding that proposed occupational health standards are reasonably necessary to provide safe workplaces. When OSHA acts to reduce existing national consensus standards, therefore, it must find that (i) currently permissible exposure levels create a significant risk of material health impairment; and (ii) a reduction of those levels would significantly reduce the hazard.

Although I would not rule out the possibility that the necessary findings could rest in part on generic policies properly adopted by OSHA, see McGarity, *Substantive and Procedural Discretion in Administrative Resolution of Science Policy Questions: Regulating Carcinogens in EPA and OSHA*, 67 Geo.L.J. 729, 754-759 (1979), no properly

(1935), and *Panama Refining Co. v. Ryan*, 293 U.S. 388, 55 S.Ct. 241, 79 L.Ed. 446 (1935). See *post*, at 2878 (REHNQUIST, J., concurring).

1. These portions of the plurality opinion primarily address OSHA's special carcinogen policy, rather than OSHA's argument that it also made evidentiary findings. I do not necessarily agree with every observation in the plurality opinion concerning the presence or absence of such findings. I also express no view on the question whether a different interpretation of the statute would violate the nondelegation doctrine of *Schechter Poultry Corp. v. United States*, 295 U.S. 495, 55 S.Ct. 837, 79 L.Ed. 1570

2. The Secretary of Labor promulgated the relevant standard pursuant to his statutory authority. Since OSHA is the agency responsible for developing such regulations under the Secretary's direction, this opinion refers to "OSHA" or "the agency" as the decisionmaker most directly concerned.

supported agency policies are before us in this case.³ I therefore agree with the plurality that the regulation is invalid to the extent it rests upon the assumption that exposure to known carcinogens always should be reduced to a level proven to be safe or, if no such level is found, to the lowest level that the affected industry can achieve with available technology.

I

If the disputed regulation were based exclusively on this "carcinogen policy," I also would agree that we need not consider whether the Act requires OSHA to determine that the benefits of a proposed standard are reasonably related to the costs of compliance. *Ante*, at 2850-2851. As the Court of Appeals for the Fifth Circuit recognized, however, OSHA takes the "fall-back position" that its regulation is justified by specific findings based upon the voluminous evidentiary record compiled in this case. 581 F.2d 493, 503. OSHA found, for example, that the number of cancers prevented by reducing permissible exposure levels from 10 ppm to 1 ppm "may be appreciable," that "the benefits of the proposed standard are likely to be appreciable," and that the "substantial costs [of the new standard] are justified in light of the hazards." 43 Fed.Reg., at 5940-5941. Thus, OSHA found—at least generally—that the hazards of benzene exposure at currently permissible levels are serious enough to justify an expenditure of hundreds of millions of dollars. For me, that finding necessarily subsumes the conclusion that the health risk is "significant." If OSHA's conclusion is supported by substantial evidence, the threshold requirement discussed in the plurality opinion would be satisfied.

As I read its opinion, the plurality does not consider whether the agency's findings are supported by substantial evidence. The

Court of Appeals found them insufficient because OSHA failed "to estimate the extent of expected benefits." 581 F.2d, at 504. That court apparently would have required OSHA to supply a specific numerical estimate of benefits derived through mathematical techniques for "risk quantification" or "cost-effectiveness analysis." *Id.*, at 504, n. 23; see *id.*, at 504-505. I do not agree with the Court of Appeals' conclusion that the statute requires quantification of risk in every case.

The statutory preference for the "best available evidence," 29 U.S.C. § 655(b)(5), implies that OSHA must use the best known techniques for the accurate estimation of risks and benefits when such techniques are available. But neither the statute nor the legislative history suggests that OSHA's hands are tied when reasonable quantification cannot be accomplished by any known methods. See *post*, at 2887 (MARSHALL, J., dissenting). In this case, OSHA found that "it is impossible to precisely quantify the anticipated benefits."

43 Fed.Reg., at 5941. If this finding is supported by substantial evidence, the statute does not prevent the Secretary from finding a significant health hazard on the basis of the weight of expert testimony and opinion. I do not understand the plurality to hold otherwise. See *ante*, at 2873.

For the foregoing reasons, I would not hold that "OSHA did not even attempt to carry its burden of proof" on the threshold question whether exposure to benzene at 10 ppm presents a significant risk to human health. *Ante*, at 2870. In my view, the question is whether OSHA successfully carried its burden on the basis of record evidence. That question in turn reduces to two principal issues. First, is there substantial evidence supporting OSHA's determination that available quantification tech-

istrative judgments upon which the policy rests are supported adequately on this record alone. Accordingly, we have no occasion to consider the extent to which valid agency policies may supply a basis for a finding that health risks exist in particular cases.

niques are to be used. Then OSHA regulation is required. Significant risk is supported by then OSHA regulation is required. I do not see how OSHA can avoid safe and

Although I do not dissent, that OSHA carry its burden on these issues summarizes the assumptions that I dissenting), requires the economic consequences of reasonable regulation. An

4. OSHA's promulgation in the Senate with available Particular OSHA's to the economic industry. See *Bor v. Br*. In this case, I am firm to as 1 ppm standard then concluded [compliance financial] general economic cost of a "bearable" the benefit company, for sources of costs. But poses may remain

5. I will not legislative opinion. Consider show Congress persuade OSHA to

3. OSHA has adopted a formal policy for regulating carcinogens effective April 21, 1980. 45 Fed.Reg. 5002 (Jan. 22, 1980). But no such policy was in effect when the agency promulgated its benzene regulation. Moreover, neither the factual determinations nor the admin-

niques are too imprecise to permit a reasonable numerical estimate of risks? If not, then OSHA has failed to show that its regulation rests on the "best available evidence." Second, is OSHA's finding of significant risks at current exposure levels supported by substantial evidence? If not, then OSHA has failed to show that the new regulation is reasonably necessary to provide safe and healthful workplaces.

II

Although I regard the question as close, I do not disagree with the plurality's view that OSHA has failed, on this record, to carry its burden of proof on the threshold issues summarized above. But even if one assumes that OSHA properly met this burden, see *post*, at 2887 (MARSHALL, J., dissenting), I conclude that the statute also requires the agency to determine that the economic effects of its standard bear a reasonable relationship to the expected benefits. An occupational health standard is

neither "reasonably necessary" nor "feasible," as required by statute, if it calls for expenditures wholly disproportionate to the expected health and safety benefits.

OSHA contends that § 6(b)(5) not only permits but actually requires it to promulgate standards that reduce health risks without regard to economic effects, unless those effects would cause widespread dislocation throughout an entire industry.⁴ Under the threshold test adopted by the plurality today, this authority will exist only with respect to "significant" risks. But the plurality does not reject OSHA's claim that it must reduce such risks without considering economic consequences less serious than massive dislocation. In my view, that claim is untenable.

Although one might wish that Congress had spoken with greater clarity, the legislative history and purposes of the statute do not support OSHA's interpretation of the Act.⁵ It is simply unreasonable to believe

out regard to economic consequences. Senator Williams, a sponsor of the legislation, stated that: "Our bill is fair and reasonable. It is a good-faith effort to balance the need of workers to have a safe and healthy work environment against the requirement of industry to function without undue interference." Subcommittee on Labor of the Senate Committee on Labor and Public Welfare, Legislative History of the Occupational Safety and Health Act of 1970, 92d Cong., 1st Sess., p. 435 (Comm. Print 1971). There could no such "balance" if OSHA were authorized to impose standards without regard to economic consequences short of serious dislocation.

Senator Dominick described a preliminary version of § 6(b)(5) as follows: "What we were trying to do in the bill was to say that when we are dealing with toxic agents or physical agents, we ought to take such steps as are *feasible and practical* to provide an atmosphere within which a person's health or safety would not be affected. Unfortunately, we had language providing that anyone [sic] would be assured that no one would have a hazard. . . . It was an unrealistic standard. . . . Legislative History, *supra*, at 502 (emphasis added).

Senator Dominick's objection to the "unrealistic" standard of the forerunner of § 6(b)(5) does not imply that he thought § 3(8) of the Act lacked substantive content. See *post*, at 2887 (MARSHALL, J., dissenting). The Senator

4. OSHA argues that § 6(b)(5) requires it to promulgate standards that are "feasible" only in the sense that they are "capable of achievement"; that is, achievable "at bearable cost with available technology." Brief for the Federal Parties 57. The lower courts have indicated that a standard is not "infeasible" under OSHA's test unless it would precipitate "massive economic dislocation" in the affected industry. See, e.g., *American Federation of Labor v. Brennan*, 530 F.2d 109, 123 (CA3 1975). In this case, OSHA simply asked a consulting firm to ascertain the costs of complying with a 1 ppm standard. See *ante*, at 2854. OSHA then concluded that "the economic impact of [compliance] will not threaten the financial welfare of the affected firms or the general economy." 43 Fed.Reg., at 5939. The cost of complying with a standard may be "bearable" and still not reasonably related to the benefits expected. A manufacturing company, for example, may have financial resources that enable it to pay the OSHA-ordered costs. But expenditures for unproductive purposes may limit seriously its financial ability to remain competitive and provide jobs.

5. I will not repeat the detailed summary of the legislative history contained in the plurality opinion. *Ante*, at 2866-2869. Many of the considerations that the plurality relies upon to show Congress' concern with significant harms persuade me that Congress did not intend OSHA to reduce each significant hazard with-

that Congress intended OSHA to pursue the desirable goal of risk-free workplaces to the extent that the economic viability of particular industries—or significant segments thereof—is threatened. As the plurality observes, OSHA itself has not chosen to carry out such a self-defeating policy in all instances. *Ante*, at 2868. If it did, OSHA regulations would impair the ability of American industries to compete effectively with foreign businesses and to provide employment for American workers.⁶

I therefore would not lightly assume that Congress intended OSHA to require reduction of health risks found to be significant whenever it also finds that the affected industry can bear the costs. See *supra*, at 2850, n. 4. Perhaps more significantly, however, OSHA's interpretation of § 6(b)(5) would force it to regulate in a manner inconsistent with the important health and safety purposes of the legislation we construe today. Thousands of toxic substances present risks that fairly could be characterized as "significant." Cf. *ante*, at 2866, n. 51. Even if OSHA succeeded in selecting the gravest risks for earliest regulation, a standard-setting process that ignored economic considerations would result in a serious misallocation of resources and a lower effective level of safety than could be achieved under standards set with reference to the comparative benefits available at a

hardly would have proposed that § 6(b)(5) be deleted entirely, see *ante*, at 2867, if he had not thought that other sections of the Act required health regulations that were reasonable and practical.

6. Congress has assigned OSHA an extremely difficult and complex task, and the guidance afforded OSHA is considerably less than clear. The agency's primary responsibility, reflected in its title, is to minimize health and safety risks in the workplace. Yet the economic health of our highly industrialized society requires a high rate of employment and an adequate response to increasingly vigorous foreign competition. There can be little doubt that Congress intended OSHA to balance reasonably the societal interest in health and safety with the often conflicting goal of maintaining a strong national economy.

7. For example, OSHA's reading of § 6(b)(5) could force the depletion of an industry's re-

lower cost.⁷ I would not attribute such an irrational intention to Congress.

In this case, OSHA did find that the "substantial costs" of the benzene regulations are justified. See *supra*, at 2850. But the record before us contains neither adequate documentation of this conclusion, nor any evidence that OSHA weighed the relevant considerations. The agency simply announced its finding of cost-justification without explaining the method by which it determines that the benefits justify the costs and their economic effects. No rational system of regulation can permit its administrators to make policy judgments without explaining how their decisions effectuate the purposes of the governing law, and nothing in the statute authorizes such laxity in this case.⁸ Since neither the airborne concentration standard nor the dermal contact standard for exposure to benzene satisfies the requirements of the governing statute, I join the Court's judgment affirming the judgment of the Court of Appeals.

Mr. Justice REHNQUIST, concurring in the judgment.

The statutory provision at the center of the present controversy, § 6(b)(5) of the Occupational Safety and Health Act of 1970, states, in relevant part, that the Secretary of Labor

sources in an effort to reduce a single risk by some speculative amount, even though other significant risks remain unregulated.

8. The decision that costs justify benefits is largely a policy judgment delegated to OSHA by Congress. When a court reviews such judgments under the "substantial evidence" standard mandated by 29 U.S.C. § 655(f), the court must determine whether the responsible agency has "[carefully] identify[ed] . . . the reasons why [it] chooses to follow one course rather than another" as the most reasonable method of effectuating the purposes of the applicable law. *Industrial Union Department v. Hodgson*, 162 U.S.App.D.C. 331, 339, 499 F.2d 467, 475-476 (1974). Since OSHA failed to identify its reasons in this case, I express no opinion as to the standard of review that may be appropriate in other situations.

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“ . . . in promulgating standards dealing with toxic materials or harmful physical agents . . . shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life.” 29 U.S.C. § 655(b)(5) (emphasis added).

According to the Secretary, who is one of the petitioners herein, § 6(b)(5) imposes upon him an absolute duty, in regulating harmful substances like benzene for which no safe level is known, to set the standard for permissible exposure at the lowest level that “can be achieved at a bearable cost with available technology.” Brief for the Federal Parties 57. While the Secretary does not attempt to refine the concept of “bearable cost,” he apparently believes that a proposed standard is economically feasible so long as its impact “will not be such as to threaten the financial welfare of the affected firms or the general economy.” 43 Fed. Reg., at 5939.

Respondents reply, and the lower court agreed, that § 6(b)(5) must be read in light of another provision in the same act, § 3(8), which defines an “occupational health and safety standard” as

“ . . . a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment.” 29 U.S.C. § 652(8).

According to respondents, § 6(b)(5), as tempered by § 3(8), requires the Secretary to demonstrate that any particular health standard is justifiable on the basis of a rough balancing of costs and benefits.

1. J. Locke, Second Treatise of Civil Government ¶141 (1690). In the same treatise, Locke also wrote that “The legislative cannot transfer the power of making laws to any other hands;

In considering these alternative interpretations, my colleagues manifest a good deal of uncertainty, and ultimately divide over whether the Secretary produced sufficient evidence that the proposed standard for benzene will result in any appreciable benefits at all. This uncertainty, I would suggest, is eminently justified, since I believe that this case presents the Court with what has to be one of the most difficult issues that could confront a decision-maker: whether the statistical possibility of future deaths should ever be disregarded in light of the economic costs of preventing those deaths. I would also suggest that the widely varying positions advanced in the briefs of the parties and in the opinions of Mr. Justice STEVENS, THE CHIEF JUSTICE, Mr. Justice POWELL, and Mr. Justice MARSHALL demonstrate, perhaps better than any other fact, that Congress, the governmental body best suited and most obligated to make the choice confronting us in this case, has improperly delegated that choice to the Secretary of Labor and, derivatively, to this Court.

I

In his Second Treatise of Civil Government, published in 1690, John Locke wrote that “The power of the legislative, being derived from the people by a positive voluntary grant and institution, can be no other than what that positive grant conveyed, which being only to make laws, and not to make legislators, the legislative can have no power to transfer their authority of making laws and place it in other hands.”¹ Two hundred years later, this Court expressly recognized the existence of and the necessity for limits on Congress’s ability to delegate its authority to representatives of the Executive Branch: “That Congress cannot delegate legislative power to the president is a principle universally recognized as vital to the integrity and maintenance of the system of government ordained by the Con-

for it being but a delegated power from the people, they who have it cannot pass it over to others.” *Ibid.*

stitution." *Field v. Clark*, 143 U.S. 649, 692, 12 S.Ct. 495, 504, 36 L.Ed. 294 (1892).²

The rule against delegation of legislative power is not, however, so cardinal of principle as to allow for no exception. The Framers of the Constitution were practical statesmen, who saw that the doctrine of separation of powers was a two-sided coin. James Madison, in Federalist Paper No. XLVII, for example, recognized that while the division of authority among the various branches of government was a useful principle, "the degree of separation which the maxim requires, as essential to a free government, can never in practice be duly maintained."

This Court also has recognized that a hermetic sealing-off of the three branches of government from one another could easily frustrate the establishment of a national government capable of effectively exercising the substantive powers granted to the various branches by the Constitution. Mr. Chief Justice Taft, writing for the Court in *Hampton & Co. v. United States*, 276 U.S. 394, 48 S.Ct. 348, 72 L.Ed. 624 (1928), noted the practicalities of the balance that has to be struck:

"[T]he rule is that in the actual administration of the government Congress or the Legislature should exercise the legislative power, the President or the state executive, the Governor, the executive power, and the courts or the judiciary the judicial power, and in carrying out that constitutional division into three branches it is a breach of the national fundamental law if Congress gives up its legislative power and transfers it to the President, or to the Judicial branch, or if by law it attempts to invest itself or its members with either executive power or judicial power. This is not to say that the three branches are not coordinate parts of one government and that each in the field of its duties may not invoke the action of

the two other branches in so far as the action invoked shall not be an assumption of the constitutional field of action of another branch. In determining what it may do in seeking assistance from another branch, the extent and character of that assistance must be fixed according to common sense and the inherent necessities of the governmental co-ordination." 276 U.S., at 406, 48 S.Ct., at 351.

During the third and fourth decades of this century, this Court within a relatively short period of time struck down several acts of Congress on the grounds that they exceeded the authority of Congress under the Commerce Clause or under the nondelegation principle of separation of powers, and at the same time struck down state statutes because they violated "substantive" due process or interfered with interstate commerce. See generally R. H. Jackson, *The Struggle for Judicial Supremacy* 48-123 (1949). When many of these decisions were later overruled, the principle that Congress could not simply transfer its legislative authority to the executive fell under a cloud. Yet in my opinion decisions such as *Panama Refining Co. v. Ryan*, 293 U.S. 388, 55 S.Ct. 241, 79 L.Ed. 446 (1935), suffer from none of the excesses of judicial policymaking that plagued some of the other decisions of that era. The many later decisions that have upheld congressional delegations of authority to the Executive Branch have done so largely on the theory that Congress may wish to exercise its authority in a particular field, but because the field is sufficiently technical, the ground to be covered sufficiently large, and the Members of Congress themselves not necessarily expert in the area in which they choose to legislate, the most that may be asked under the separation-of-powers doctrine is that Congress lay down the general policy and standards that animate the law, leaving the

United States" delegated too much discretion to the Executive Branch. See *The Brig Aurora*, 7 Cranch 382, 383, 386, 388, 11 U.S. 382, 3 L.Ed. 378 (1813).

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2. As early as 1813, this Court had considered and rejected an argument that a statute authorizing the President to terminate a trade embargo on Britain and France if those two nations ceased violating "the neutral commerce of the

agency to refine those standards, "fill in the blanks," or apply the standards to particular cases. These decisions, to my mind, simply illustrate the principle stated more than fifty years ago by Mr. Chief Justice Taft that delegations of legislative authority must be judged "according to common sense and the inherent necessities of the governmental co-ordination." 276 U.S., at 406, 48 S.Ct., at 351.

Viewing the legislation at issue here in light of these principles, I believe that it fails to pass muster. Read literally, the relevant portion of § 6(b)(5) is completely precatory, admonishing the Secretary to adopt the most protective standard if he can, but excusing him from that duty if he can't. In the case of a hazardous substance for which a "safe" level is either unknown or impractical, the language of § 6(b)(5) gives the Secretary absolutely no indication where on the continuum of relative safety he should draw his line. Especially in light of the importance of the interests at stake, I have no doubt that the provision at issue, standing alone, would violate the doctrine against uncanalized delegations of legislative power. For me the remaining question, then, is whether additional standards are ascertainable from the legislative history or statutory context of § 6(b)(5) or, if not, whether such a standardless delegation was justifiable in light of the "inherent necessities" of the situation.

II

One of the primary sources looked to by this Court in adding gloss to an otherwise broad grant of legislative authority is the legislative history of the statute in question. The opinions of Mr. Justice STEVENS and Mr. Justice MARSHALL, however, give little more than a tip of the hat to the legislative origins of § 6(b)(5). Such treatment is

perhaps understandable, since the legislative history of that section, far from shedding light on what important policy choices Congress was making in the statute, gives one the feeling of viewing the congressional purpose "by the dawn's early light."

The precursor of § 6(b)(5) was placed in the Occupational Safety & Health Act of 1970 while that bill was pending in the House Committee on Education and Labor. At that time, the section read:

"The Secretary, in promulgating standards under this subsection, shall set the standard which most adequately assures, on the basis of the best available professional evidence, that no employee will suffer any impairment of health, or functional capacity, or diminished life expectancy even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life." Legislative History, Occupational Safety & Health Act of 1970, 92d Cong. 943 (hereinafter Leg.Hist.).

Three aspects of this original proposal are particularly significant. First, and perhaps most importantly, as originally introduced the provision contained no feasibility limitation, providing instead that the Secretary "shall set the standard which most adequately assures" that no employee will suffer harm. Second, it would have required the Secretary to protect employees from "any" impairment of health or functional capacity. Third, on its face, although perhaps not in its intent, the provision applied to both health and safety standards promulgated under the Act.³

There can be little doubt that, at this point in its journey through Congress, § 6(b)(5) would have required the Secretary, in regulating toxic substances, to set the permissible level of exposure at a safe level or, if no safe level was known, at zero.

Education and Labor stated that the proposed version of § 6(b)(5) would apply when the Secretary set an "occupational health standard." Legislative History, Occupational Safety & Health Act of 1970, 92d Cong. 848 (hereinafter Leg.Hist.).

3. Respondents argue that, despite its seemingly general application, the original version of § 6(b)(5) actually referred only to health hazards as opposed to safety hazards. See Brief for Respondents 5b-6b. In support of this proposition, they cite a portion of the legislative history where the House Committee on

When the Senate Committee on Labor and Public Welfare considered a provision identical in almost all respects to the House version, however, Senator Javits objected that the provision in question "might be interpreted to require absolute health and safety in all cases, regardless of feasibility."

Leg.Hist. 197. See also *id.*, at 418. The Committee therefore amended the bill to provide that the Secretary "shall set the standard which most adequately and feasibly" assured that no employee would suffer any impairment of health. *Id.*, at 242 (emphasis added). The only additional explanation for this change appeared in the Senate Report accompanying the bill to the Senate floor. There, the Committee explained that

standards promulgated under § 6(b) shall represent *feasible requirements* which, where appropriate, shall be based on research, experiments, demonstrations, past experience, and the latest available scientific data. Such standards should be directed at assuring, so far as possible, that no employee will suffer impaired health of functional capacity or diminished life expectancy, by reason of the exposure to the hazard involved, even though such exposure may be over the period of his entire working life." Leg.Hist. 147 (emphasis added).

Despite Senator Javits' inclusion of the words "and feasibly" in the provision, participants in the floor debate immediately characterized § 6(b)(5) as requiring the Secretary "to establish a utopia free from any hazards" and to "assure that there will not be any risk at all." Leg.Hist. 480-481 (Remarks of Sen. Dominick). Senator Saxbe stated:

"When we come to saying that an employer must guarantee that such an employee is protected from any possible harm, I think it will be one of the most difficult areas we are going to have to ascertain. . . . I believe the terms that we are passing back and forth are going to have to be 'identified.'" Leg.Hist., at 345.

In response to these concerns, Senator Dominick introduced a substitute for the proposed provision, deleting the sentence at issue here entirely. He explained that his amendment would delete

"the requirement in § 6(b)(5) that the Secretary will establish occupational safety and health standards which most adequately and feasibly assure to the extent possible that no employee will suffer any impairment of health or functional capacity or diminished life expectancy even if the employee has regular exposure to the hazard dealt with by the standard for the period of his working life."

"This requirement is inherently confusing and unrealistic. It could be read to require the Secretary to ban all occupations in which there remains some risk of injury, impaired health, or life expectancy. In the case of all occupations, it will be impossible to eliminate all risks to safety and health. Thus, the present criteria could, if literally applied, close every business in this nation. 'In addition, in many cases, the standard which might most 'adequately' and 'feasibly' assure the elimination of the danger would be the prohibition of the occupation itself."

"If the provision is intended as no more than an admonition to the Secretary to do his duty, it seems unnecessary and could, if deemed advisable be included in the legislative history." (Emphasis in original.) Leg.Hist. 367.

Eventually, Senator Dominick and his supporters settled for the present language of § 6(b)(5). This agreement resulted in three changes from the original version of the provision as amended by Senator Javits. First, the provision was altered to state explicitly that it applied only to standards for "toxic materials or harmful physical agents," in apparent contrast with safety standards. Second, the Secretary was no longer admonished to protect employees from "any" impairment of their health, but rather only from "material" impairments. Third, and most importantly for our pur-

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poses, the phrase "most adequately and feasibly assures" was revamped to read "most adequately assures, to the extent feasible.]"

We have been presented with a number of different interpretations of this shift. According to the Secretary, Senator Dominick recognized that he could not delete the seemingly absolute requirements of § 6(b)(5) entirely, and instead agreed to limit its application to toxic materials or harmful physical agents and to specify that the Secretary was only to protect employees from material impairment of their health. Significantly, the Secretary asserts that his mandate to set such standards at the safest level technologically and economically achievable remained unchanged by the Dominick Amendment. According to the Secretary, the change in language from "most adequately and feasibly assures" to "most adequately assures, to the extent feasible," represented only a slight shift in emphasis, perhaps suggesting "a preference for health protection over cost." Brief for the Federal Parties 7a. See also *id.*, at 59.

Mr. Justice MARSHALL reads this history quite differently. 'In his view, the version of § 6(b)(5) that reached the Senate floor did not "clearly embody[] the feasibility requirement" and thus was soundly criticized as being unrealistic. See *post*, at 2889. It was only as a result of the floor amendments, which replaced "most adequately and feasibly assures" with "most adequately assures, to the extent feasible," that the Secretary clearly was authorized to reject a standard if it proved technologically or economically infeasible. See also *id.*, at 23, 24, and n. 34.

Respondents cast yet a third light on these events, focusing upon a few places in

the legislative history where the words "feasible" and "reasonable" were used more or less interchangeably. See Leg.Hist. 38-40; 115 Cong.Rec. 22517 (Aug. 6, 1969) (statement of Sen. Javits). It is their contention that, when Congress said "feasible," it meant cost justified. According to respondents, who agree in this regard with the Secretary, the meaning of the feasibility requirement did not change substantially between the version that left the Senate Committee on Labor and Public Welfare and the version that was ultimately adopted as part of the Act.

To my mind, there are several lessons to be gleaned from this somewhat cryptic legislative history. First, as pointed out by Mr. Justice MARSHALL, to the extent that Senator Javits, Senator Dominick, and other members were worried about imposing upon the Secretary the impossible burden of assuring absolute safety, they did not view § 3(8) of the Act as a limitation on that duty. I therefore find it difficult to accept the conclusion of the lower court, as embellished by respondents, that § 3(8) acts as a general check upon the Secretary's duty under § 6(b)(5) to adopt the most protective standard feasible.

Second, and more importantly, I believe that the legislative history demonstrates that the feasibility requirement, as employed in § 6(b)(5), is a legislative mirage, appearing to some members but not to others, and assuming any form desired by the beholder. I am unable to accept Mr. Justice MARSHALL's argument that, by changing the phrasing of § 6(b)(5) from "most adequately and feasibly assures" to "most adequately assures, to the extent feasible," the Senate injected into that section something that wasn't already there.⁴ If I am correct

4. The legislative history indicates strongly that Senator Dominick himself saw little, if any, difference between the phrases "most adequately and feasibly assures" and "most adequately assures, to the extent feasible." In the course of his earlier attempt to delete the first sentence of § 6(b)(5) entirely, he paraphrased the unamended version of that section as requiring the Secretary to promulgate standards

that "most adequately and feasibly assure to the extent possible" that no employee would suffer harm. See Leg.Hist. 367 (emphasis added). Unless Senator Dominick found a significant difference between the words "possible" and "feasible," it is clear that there is little difference between Senator Dominick's perception of what the unamended section required in

in this regard, then the amendment introduced by Senator Javits to relieve the Secretary of the duty to create a risk-free workplace left Senator Dominick free to object to the amended provision on the same grounds. Perhaps Senator Dominick himself offered the aptest description of the feasibility requirement as "no more than admonition to the Secretary to do his duty."

Leg.Hist. 367.

In sum, the legislative history contains nothing to indicate that the language "to the extent feasible" does anything other than render what had been a clear, if somewhat unrealistic, standard largely, if not entirely, precatory. There is certainly nothing to indicate that these words, as used in § 6(b)(5), are limited to technological and economic feasibility. When Congress has wanted to limit the concept of feasibility in this fashion, it has said so, as is evidenced in a statute enacted the same week as the provision at issue here.⁵ I also question whether the Secretary wants to assume the duties such an interpretation would impose upon him. In this case, for example, the Secretary actually declined to adopt a standard lower than 1 ppm for some industries, not because it was economically or technologically infeasible, but rather because "different levels for different industries would result in serious administrative difficulties." Appx. to Pet. for Cert., at 188a. See also *ante*, at 2868-2869 (plurality opinion). If § 6(b)(5) authorizes the Secretary to reject a more protective standard in the interest of administrative feasibility, I have little doubt that he could reject such standards for any reason whatsoever, including even political feasibility.

III

In prior cases this Court has looked to sources other than the legislative history to

the way of feasibility and what that section required after his amendment.

5. Section 211(c)(2)(A) and (B) of the Clean Air Act, as amended on Dec. 31, 1970, authorizes the Environmental Protection Agency to regu-

breathe life into otherwise vague delegations of legislative power. In *American Power & Light Co. v. SEC*, 329 U.S. 90, 104, 67 S.Ct. 133, 141, 91 L.Ed. 103 (1946), for example, this Court concluded that certain seemingly vague delegations "derive[d] much meaningful content from the purpose of the Act, its factual background and the statutory context in which they appear." Here, however, there is little or nothing in the remaining provisions of the Occupational Safety & Health Act to provide specificity to the feasibility criterion in § 6(b)(5). It may be true, as suggested by Mr. Justice MARSHALL, that the Act as a whole expresses a distinct preference for safety over dollars. But that expression of preference, as I read it, falls far short of the proposition that the Secretary must eliminate marginal or insignificant risks of material harm right down to an industry's breaking point.

Nor is this a case like *Lichter v. United States*, 334 U.S. 742, 783, 68 S.Ct. 1294, 1315, 92 L.Ed. 1694 (1948), where this Court upheld delegation of authority to recapture "excessive profits" in light of a pre-existing administrative practice. Here, the Secretary's approach to toxic substances like benzene could not have predated the enactment of § 6(b)(5) itself. Moreover, there are indications that the postenactment administrative practice has been less than uniform. For example, the Occupational Safety & Health Review Commission (OSHRC), the body charged with adjudicating citations issued by the Secretary under the Act, apparently does not agree with the definition of "feasibility," advanced in this case by the Secretary. In *Continental Can Co.*, 4 BNA OSHC 1541, 1976-1977 CCH OSHC ¶21,009 (1976), the Commission reasoned:

"Clearly, employers have finite resources available for use to abate health hazards. And just as clearly if they are to be made to spend without limit for abatement of

late, control, or prohibit automotive fuel additives after "consideration of other technologically or economically feasible means of achieving emission standards . . ." 42 U.S.C. § 7545(c)(2)(A) (emphasis added).

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this hazard their financial ability to abate other hazards, including life threatening hazards, is reduced." *Id.*, at 1547, 1976-1977 CCH OSHC, at 25,256.

Furthermore, the record in this case contains at least one indication that the Secretary himself was, at one time, quite uncertain what limits § 6(b)(5) placed upon him. In announcing the proposed 1 ppm standard and discussing its economic ramifications, the Secretary explained that "[w]hile the precise meaning of feasibility is not clear from the Act, it is OSHA's view that the term may include the economic ramifications of requirements imposed by standards." App. 133a. This candid and tentative statement falls far short of the Secretary's present position that economic and technological considerations set the only limits on his duty to adopt the most protective standard. Finally, as noted earlier, the Secretary has failed to apply his present stringent view uniformly, rejecting in this case a lower standard for some industries on the grounds of administrative convenience.

In some cases where broad delegations of power have been examined, this Court has upheld those delegations because of the delegatee's residual authority over particular subjects of regulation. In *United States v. Curtiss-Wright Export Corp.*, 299 U.S. 304, 57 S.Ct. 216, 81 L.Ed. 255 (1936), this Court upheld a statute authorizing the President to prohibit the sale of arms to certain countries if he found that such a prohibition would "contribute to the reestablishment of peace[.]" This Court reasoned that, in the area of foreign affairs, Congress "must often accord to the President a degree of discretion and freedom from statutory restriction which would not be admissible were domestic affairs alone involved." *Id.*, at 320, 57 S.Ct. at 221. Similarly, *United States v. Mazurie*, 419 U.S. 544, 95 S.Ct. 710, 42 L.Ed.2d 706 (1975), upheld a broad delegation of authority to various Indian tribes to regulate the introduction of liquor into Indian country. According to *Mazurie*, limitations on Congress' authority to delegate legislative power are "less stringent in

cases where the entity exercising the delegated authority itself possesses independent authority over the subject matter." *Id.*, at 556-557, 95 S.Ct. at 717. In the present case, however, neither the Executive Branch in general nor the Secretary in particular enjoy any independent authority over the subject matter at issue.

Finally, as indicated earlier, in some cases this Court has abided by a rule of necessity, upholding broad delegations of authority where it would be "unreasonable and impracticable to compel Congress to prescribe detailed rules" regarding a particular policy or situation. *American Power & Light Co. v. SEC*, 329 U.S. 90, 105, 67 S.Ct. 133, 142, 91 L.Ed. 103 (1946). See also *Buttfield v. Stranahan*, 192 U.S. 470, 496, 24 S.Ct. 349, 355, 48 L.Ed. 525 (1904). But no need for such an evasive standard as "feasibility" is apparent in the present case. In drafting § 6(b)(5), Congress was faced with a clear, if difficult, choice between balancing statistical lives and industrial resources or authorizing the Secretary to elevate human life above all concerns save massive dislocation in an affected industry. That Congress recognized the difficulty of this choice is clear from the previously noted remark of Senator Saxbe, who stated that "When we come to saying that an employer must guarantee that such an employee is protected from any possible harm, I think it will be one of the most difficult areas we are going to have to ascertain." Leg.Hist. 345. That Congress chose, intentionally or unintentionally, to pass this difficult choice on to the Secretary is evident from the spectral quality of the standard it selected and is capsulized in Senator Saxbe's unfulfilled promise that "the terms that we are passing back and forth are going to have to be identified." *Ibid.*

IV

As formulated and enforced by this Court, the nondelegation doctrine serves three important functions. First, and most abstractly, it ensures to the extent consistent with orderly governmental administra-

tion that important choices of social policy are made by Congress, the branch of our government most responsive to the popular will. See *Arizona v. California*, 373 U.S. 546, 626, 83 S.Ct. 1468, 1511, 10 L.Ed.2d 542 (1963) (Harlan, J., dissenting in part); *United States v. Robel*, 389 U.S. 258, 276, 88 S.Ct. 419, 430, 19 L.Ed.2d 508 (1967) (BRENNAN, J., concurring in the result). Second, the doctrine guarantees that, to the extent Congress finds it necessary to delegate authority, it provides the recipient of that authority with an "intelligible principle" to guide the exercise of the delegated discretion. See *Hampton & Co. v. United States*, 276 U.S. 394, 409, 48 S.Ct. 348, 352, 2 L.Ed. 624 (1928); *Panama Refining Co. v. Ryan*, 293 U.S. 388, 430, 55 S.Ct. 241, 252, 9 L.Ed. 446 (1935). Third, and derivative of the second, the doctrine ensures that courts charged with reviewing the exercise of delegated legislative discretion will be able to test that exercise against ascertainable standards. See *Arizona v. California*, *supra*, 373 U.S., at 626, 83 S.Ct., at 1511 (Harlan, J., dissenting in part); *American Power & Light Co. v. SEC*, 329 U.S. 90, 106, 7 S.Ct. 133, 142, 91 L.Ed. 103 (1946).

I believe the legislation at issue here fails on all three counts. The decision whether the law of diminishing returns should have any place in the regulation of toxic substances is quintessentially one of legislative policy. For Congress to pass that decision to the Secretary in the manner it did violates, in my mind, John Locke's caveat—reflected in the cases cited earlier in this opinion—that legislatures are to make laws, not legislators. Nor, as I think the prior discussion amply demonstrates, do the provisions at issue or their legislative history provide the Secretary with any guidance

See J. H. Ely, *Democracy and Distrust*, a Theory of Judicial Review 131-134 (1980); J. D. Freedman, *Crisis and Legitimacy, the Administrative Process and American Government* 78-94 (1978); T. J. Lowi, *The End of Liberalism: Ideology, Policy, and the Crisis of Public Authority* 129-146, 297-299 (1969); J. Wright, *Beyond Discretionary Justice*, 81 Yale L.J. 575, 582-587 (1972); *Waist-Deep in Regulation*, Washington Post, Nov. 3, 1979, p. A10.

that might lead him to his somewhat tentative conclusion that he must eliminate exposure to benzene as far as technologically and economically possible. Finally, I would suggest that the standard of "feasibility" renders meaningful judicial review impossible.

We ought not to shy away from our judicial duty to invalidate unconstitutional delegations of legislative authority solely out of concern that we should thereby reinvigorate discredited constitutional doctrines of the pre-New Deal era. If the nondelegation doctrine has fallen into the same desuetude as have substantive due process and restrictive interpretations of the Commerce Clause, it is, as one writer has phrased it, "a case of death by association[.]" J. H. Ely, *Democracy and Distrust, a Theory of Judicial Review* 133 (1980). Indeed, a number of observers have suggested that this Court should once more take up its burden of ensuring that Congress does not unnecessarily delegate important choices of social policy to politically unresponsive administrators.⁶ Other observers, as might be imagined, have disagreed.⁷

If we are ever to reshoulder the burden of ensuring that Congress itself make the critical policy decisions, this is surely the case in which to do it. It is difficult to imagine a more obvious example of Congress simply avoiding a choice which was both fundamental for purposes of the statute and yet politically so divisive that the necessary decision or compromise was difficult, if not impossible, to hammer out in the legislative forge. Far from detracting from the substantive authority of Congress, a declaration that the first sentence of § 6(b)(5) of the OSHA constitutes an invalid delegation to the Secretary of Labor would

col. 1. Cf. W. O. Douglas, *Go East, Young Man* 217 (1974).

7. See K. C. Davis, *Discretionary Justice: A Preliminary Inquiry* 49-51 (1969); Stewart, *The Reformation of American Administrative Law*, 88 Harv.L.Rev. 1669, 1693-1697 (1975). Cf. Jaffe, *The Illusion of the Ideal Administration*, 86 Harv.L.Rev. 1190, n. 37 (1973).

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and (6) the standard would not materially harm the financial condition of the covered industries. The Court does not set aside any of these findings. Thus, it could not be plainer that the Secretary's decision was fully in accord with his statutory mandate "most adequately [to] assure[] . . . that no employee will suffer material impairment of health or functional capacity . . ."

The plurality's conclusion to the contrary is based on its interpretation of 29 U.S.C. § 652(8), which defines an occupational safety and health standard as one "which requires conditions . . . reasonably necessary or appropriate to provide safe or healthful employment. . . ." According to the plurality, a standard is not "reasonably necessary or appropriate" unless the Secretary is able to show that it is "at least more likely than not," *ante*, at 2869, that the risk he seeks to regulate is a "significant" one. *Ibid.* Nothing in the statute's language or legislative history, however, indicates that the "reasonably necessary or appropriate" language should be given this meaning. Indeed, both demonstrate that the plurality's standard bears no connection with the acts or intentions of Congress and is based only on the plurality's solicitude for the welfare of regulated industries. And the plurality uses this standard to evaluate not the agency's decision in this case, but a strawman of its own creation.

Unlike the plurality, I do not purport to know whether the actions taken by Congress and its delegates to ensure occupational safety represent sound or unsound regulatory policy. The critical problem in cases like the one at bar is scientific uncertainty. While science has determined that exposure to benzene at levels above 1 ppm creates a definite risk of health impairment, the magnitude of the risk cannot be quantified at the present time. The risk at issue has hardly been shown to be insignificant;

1. Legislative History of the Occupational Safety and Health Act of 1970 iii (Foreword by Senator Williams) (hereinafter *Legis.History*).

indeed, future research may reveal that the risk is in fact considerable. But the existing evidence may frequently be inadequate to enable the Secretary to make the threshold finding of "significance" that the Court requires today. If so, the consequence of the plurality's approach would be to subject American workers to a continuing risk of cancer and other fatal diseases, and to render the Federal Government powerless to take protective action on their behalf. Such an approach would place the burden of medical uncertainty squarely on the shoulders of the American worker, the intended beneficiary of the Occupational Safety and Health Act. It is fortunate indeed that at least a majority of the Justices reject the view that the Secretary is prevented from taking regulatory action when the magnitude of a health risk cannot be quantified on the basis of current techniques. See *ante*, at 2876-2877 (POWELL, J., concurring in part and concurring in the judgment); see also *ante*, at 2871, and n. 63 (plurality opinion).

Because today's holding has no basis in the Act, and because the Court has no authority to impose its own regulatory policies on the Nation, I dissent.

I

Congress enacted the Occupational Safety and Health Act as a response to what was characterized as "the grim history of our failure to heed the occupational health needs of our workers."¹ The failure of voluntary action and legislation at the state level, see Subcommittee on Labor of the Senate Committee on Labor and Public Welfare, 92d Cong., 1st Sess., *Legislative History of the Occupational Safety and Health Act of 1970* (Comm.Print 1971) (hereinafter *Legis.History*) 144, had resulted in a "bleak" and "worsening"² situation in which 14,500 persons had died annually as a result of conditions in the workplace.

2. S.Rep.No. 91-1282, 91st Cong., 2d Sess., 2 (1970); *Legis.History* 142.

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In the four years preceding the Act's passage, more Americans were killed in the workplace than in the contemporaneous Vietnam War. S.Rep.No. 91-1282, 91st Cong., 2d Sess., 2 (1970), U.S.Code Cong. & Admin. News, p. 5177; Legis.History 142. The Act was designed as "a safety bill of rights for close to 60 million workers."³ Its stated purpose is "to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources." 29 U.S.C. § 651(b). See *Atlas Roofing Co. v. OSHRC*, 430 U.S. 442, 444-445, 97 S.Ct. 1261, 1263-64, 51 L.Ed.2d 464 (1977).

The Act is enforced primarily through two provisions. First, a "general duty" is imposed upon employers to furnish employment and places of employment "free from recognized hazards that are causing or are likely to cause death or serious physical harm . . ." 29 U.S.C. § 654(a)(1). Second, the Secretary of Labor is authorized to set "occupational safety and health standards," defined as standards requiring "conditions, or the adoption or use of one or more practices, means, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment." 29 U.S.C. § 652(8).

The legislative history of the Act reveals Congress' particular concern for health hazards of "unprecedented complexity" that had resulted from chemicals whose toxic effects "are only now being discovered." S.Rep.No. 91-1282, 91st Cong., 2d Sess., 2 (1970); Legis.History 142. "Recent scientific knowledge points to hitherto unsuspected cause-and-effect relationships between occupational exposures and many of the so-called chronic diseases—cancer, respiratory ailments, allergies, heart disease, and others." *Ibid.*, U.S.Code Cong. & Admin.

News, p. 5178. Members of Congress made repeated references to the dangers posed by carcinogens and to the defects in our knowledge of their operation and effect.⁴ One of the primary purposes of the Act was to ensure regulation of these "insidious 'silent' killers."⁵

This special concern led to the enactment of the first sentence of 29 U.S.C. § 655(b)(5), which, as noted above, provides: "The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under this subsection, shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life."

This directive is designed to implement three legislative purposes. First, Congress recognized that there may be substances that become dangerous only upon repeated or frequent exposure.⁶ The Secretary was therefore required to provide protection even from substances that would cause material impairment only upon exposure occurring throughout an employee's working life. Second, the requirement that the Secretary act on the basis of "the best available evidence" was intended to ensure that the standard-setting process would not be destroyed by the uncertainty of scientific views. Recognizing that existing knowledge may be inadequate, Congress did not require the Secretary to wait until definitive information could be obtained. Thus "it is not intended that the Secretary be paralyzed by debate surrounding diverse medical opinions." H.R.Rep.No. 91-1291, 91st Cong., 2d Sess., 18 (1970); Legis.Histo-

3. Legis.History iii.

4. S.Rep.No. 91-1282, 91st Cong., 2d Sess., 2 (1970), Legis.History 159-160; Legis.History 415 (Sen. Williams); H.R.Rep.No. 91-1291, 91st Cong., 2d Sess., 19 (1970), Legis.History 849; Legis.History 1049 (Rep. Karth).

5. Legis.History 1003 (Sen. Daniels).

6. Legis.History 503 (Sen. Dominick); H.R.No. 91-1291, 91st Cong., 2d Sess., 28 (1970), Legis.History 858.

ry 848. Third, Congress' special concern for the "silent killers" was felt to justify an especially strong directive to the Secretary in the standard-setting process. Legis.History 502 (Sen. Dominick).

The authority conferred by § 655(b)(5), however, is not absolute. The subsection itself contains two primary limitations. The requirement of "material" impairment was designed to prohibit the Secretary from regulating substances that create a trivial hazard to affected employees.⁷ Moreover, all standards promulgated under the subsection must be "feasible." During the floor debates Congress expressed concern that a prior version of the bill, not clearly embodying the feasibility requirement, would require the Secretary to close down whole industries in order to eliminate risks of impairment. This standard was criticized as unrealistic.⁸ The feasibility requirement was imposed as an affirmative limit on the standard-setting power.

The remainder of § 655(b)(5), applicable to all safety and health standards, requires the Secretary to base his standards "upon research, demonstrations, experiments, and such other information as may be appropriate." In setting standards, the Secretary is directed to consider "the attainment of the

highest degree of health and safety protection for the employee" and also "the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws."

The Act makes provision for judicial review of occupational safety and health standards promulgated pursuant to § 655(b)(5). The reviewing court must uphold the Secretary's determinations if they are supported by "substantial evidence in the record considered as a whole." 29 U.S.C. § 655(f). It is to that evidence that I now turn.

II

The plurality's discussion of the record in this case is both extraordinarily arrogant and extraordinarily unfair. It is arrogant because the plurality presumes to make its own factual findings with respect to a variety of disputed issues relating to carcinogen regulation. See, e. g., ante, at 2871-2872, and n. 64. It should not be necessary to remind the Members of this Court that they were not appointed to undertake independent review of adequately supported scientific findings made by a technically expert agency.⁹ And the plurality's discussion is

In explaining the present language, Senator Dominick stated:

"What we were trying to do in the bill—unfortunately, we did not have the proper wording or the proper drafting—was to say that when we are dealing with toxic agents or physical agents, we ought to take such steps as are feasible and practical to provide an atmosphere within which a person's health or safety would not be affected. Unfortunately, we had language providing that anyone would be assured that no one would have a hazard . . . so that no one would have any problem for the rest of his working life.

"It was an unrealistic standard. As modified, we would be approaching the problem by looking at the problem and setting a standard or criterion which would not result in harm." Legis.History 502.

9. I do not, of course, suggest that it is appropriate for a federal court reviewing agency action blindly to defer to the agency's findings of fact and determinations of policy. Under *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401

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7. See n. 34, *infra*.

8. An earlier version of the bill had provided:

"The Secretary, in promulgating standards under this section, shall set the standard which most adequately and feasibly assures, on the basis of the best available evidence, that no employee will suffer any impairment of health or functional capacity, or diminished life expectancy even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life." Legis.History 242.

This standard, it was feared, "could be read to require the Secretary to ban all occupations in which there remains some risk of injury, impaired health, or life expectancy. In the case of all occupations, it will be impossible to eliminate all risks to safety and health. Thus, the present criteria could, if literally applied, close every business in the nation. In addition, in many cases, the standard which might most 'adequately' and 'feasibly' assure the prohibition of the danger would be the elimination of the occupation itself." Legis.History 367 (Statement on Amendment of Sen. Dominick).

unfair because its characterization of the Secretary's report bears practically no resemblance to what the Secretary actually did in this case. Contrary to the plurality's suggestion, the Secretary did not rely blindly on some draconian carcinogen "policy." See *ante*, at 2855-2856, 2861. If he had, it would have been sufficient for him to have observed that benzene is a carcinogen, a proposition that respondents do not dispute. Instead, the Secretary gathered over 50 volumes of exhibits and testimony and offered a detailed and evenhanded discussion of the relationship between exposure to benzene at all recorded exposure levels and chromosomal damage, aplastic anemia, and leukemia. In that discussion he evaluated, and took seriously, respondents' evidence of a safe exposure level. See also *ante*, at 2876 (POWELL, J., concurring in part and in the judgment).

The hearings on the proposed standard were extensive, encompassing 17 days from July 19 through August 10, 1977. The 95 witnesses included epidemiologists, toxicologists, physicians, political economists, industry representatives, and members of the affected work force. Witnesses were subjected to exhaustive questioning by representatives from a variety of interested groups and organizations.

Three basic positions were presented at the hearings. The first position was that the proposed 1 ppm standard was necessary because exposure to benzene would cause material impairment of the health of workers no matter how low the exposure level. Some direct evidence indicated that exposure to benzene had caused chromosomal

damage, blood disorders, and leukemia at or below the 10 ppm level itself. More important, it was suggested that the recorded effects of benzene at higher levels required an inference that leukemia and other disorders would result at levels of 1 ppm and lower, especially after the prolonged exposure typical in industrial settings. Therefore, the standard should be set at the lowest feasible level, which was 1 ppm.

The second position was that a 1 ppm exposure level would itself pose an unwarranted threat to employee health and safety and that the available evidence necessitated a significantly lower level. An exposure limit below 1 ppm, it was argued, would be feasible. There were suggestions that benzene was gradually being replaced in many of the affected industries and that most companies were already operating at or below the 1 ppm level.

The third position was that the 1971 standard should be retained. Proponents of this position suggested that evidence linking low levels of benzene exposure to leukemia was uncertain, that the current exposure limit was sufficiently safe, and that the benefits of the proposed standard would be insufficient to justify the standard's costs. In addition, there was testimony that the expenses required by the proposed standard would be prohibitive.

The regulations announcing the permanent standard for benzene are accompanied by an extensive statement of reasons summarizing and evaluating the results of the hearings. The Secretary found that the evidence showed that exposure to benzene causes chromosomal damage, a variety of

U.S. 402, 416, 91 S.Ct. 814, 823, 28 L.Ed.2d 136 (1971), courts must undertake a "searching and careful" judicial inquiry into those factors. Such an inquiry is designed to require the agency to take a "hard look." *Kleppe v. Sierra Club*, 427 U.S. 390, 410, 96 S.Ct. 2718, 2730, 49 L.Ed.2d 576 (1976) (citation omitted), by considering the proper factors and weighing them in a reasonable manner. There is also room for especially rigorous judicial scrutiny of agency decisions under a rationale akin to that offered in *United States v. Carolene Products, Inc.*, 304 U.S. 144, 152, n. 4, 58 S.Ct. 778, 783, 82 L.Ed.

1234 (1938). See *Environmental Defense Fund v. Ruckelshaus*, 142 U.S.App.D.C. 74, 439 F.2d 584 (1971).

I see no basis, however, for the approach taken by the plurality today, which amounts to nearly *de novo* review of questions of fact and of regulatory policy on behalf of institutions that are by no means unable to protect themselves in the political process. Such review is especially inappropriate when the factual questions at issue are ones about which the Court cannot reasonably be expected to have expertise.

nonmalignant blood disorders, and leukemia. (App. 81a). He concluded that low concentrations imposed a hazard that was sufficiently grave to call for regulatory action under the Act.

Evidence of deleterious effects. The Secretary referred to studies which conclusively demonstrated that benzene could damage chromosomes in blood-forming cells. (App. 126a). There was testimony suggesting a causal relationship between chromosomal damage and leukemia, although it could not be determined whether and to what extent such damage would impair health. (App. 129a-130a).¹⁰ Some studies had suggested chromosomal damage at exposure levels of 10-25 ppm and lower.¹¹ No quantitative dose-response curve, showing the relationship between exposure levels and incidence of chromosomal damage could yet be established. (App. 132a). The evidence of chromosomal damage was, in the Secretary's view, a cause for "serious concern." (App. 132a).

The most common effect of benzene exposure was a decrease in the levels of blood platelets and red and white blood cells. If sufficiently severe, the result could be pancytopenia or aplastic anemia, noncancerous but potentially fatal diseases. There was testimony that some of the nonmalignant blood disorders caused by benzene exposure could progress to or represented a preleukemic stage which might eventually evolve into a frank leukemia. (App. 83a).¹²

Considerable evidence showed an association between benzene and nonmalignant blood disorders at low exposure levels. Such an association had been established in

one study in which the levels frequently ranged from 0 to 25 ppm with some concentrations above 100 ppm (App. 87a); in another they ranged from 5 to 30 ppm (App. 89a). Because of the absence of adequate data, a dose-response curve showing the relationship between benzene exposure and blood disorders could not be constructed. There was considerable testimony, however, that such disorders had resulted from exposure to benzene at or near the current level of 10 ppm and lower.¹³ The Secretary concluded that the current standard did not provide adequate protection. He observed that a "safety factor" of 10 to 100 was generally used to discount the level at which a causal connection had been found in existing studies.¹⁴ Under this approach, he concluded that, quite apart from any leukemia risk, the permissible exposure limit should be set at a level considerably lower than 10 ppm.

Finally, there was substantial evidence that exposure to benzene caused leukemia. The Secretary concluded that the evidence established that benzene was a carcinogen. A causal relationship between benzene and leukemia was first reported in France in 1897, and since that time similar results had been found in a number of countries, including Italy, Turkey, Japan, Switzerland, the Soviet Union, and the United States. The latest study, undertaken by the National Institute for Occupational Safety and Health (NIOSH) in the 1970's, reported a five-fold excess over the normal incidence of leukemia among workers exposed to benzene at industrial plants in Ohio. There was testimony that this study seriously understated the risk.¹⁵

exposure level in the NIOSH study was extensively debated during the hearings. A report from the Industrial Commission of Ohio suggested that concentrations generally ranged from 0 to 10 or 15 ppm. But the Secretary concluded that evidence at the hearings showed that area exposures during the study period had sometimes substantially exceeded that level. Because of the conflicting evidence and the absence of monitoring data, he found that the excess leukemia risk observed in the NIOSH study could not be linked to any particular exposure level.

The Secretary suggested that the incidence of leukemia suggested by the logical definition of knowledge was significant at 9 ppm despite the fact that it should be based on other studies of leukemia risk in benzene. (App. 110a-1)

Areas of concern examined the particular points he pointed out for range from Since low increase in extremity, including the leukemia risk in benzene. But monitoring is not possible in distant areas have elapsed by the study. The finding of 10 ppm direct evidence between 1-

16. As the Secretary observed, the issue of the most hazardous exposure level in the benzene standard followed the same pattern as was not in the case of leukemia determination made by the workers. (App. 110a-1)

17. Tr.

10. Tr. 258-259, 1039.

11. Tr. 148, 200-201, 258.

12. Tr. 145, 173-174, 352, 1227, 1928, 3206; Ex. 48B, p. 166.

13. Tr. 149, 360-361, 997, 1023, 2543, 2689, 3203; Ex. 3, p. 56.

14. Tr. 149, 1218, 2692, 2847.

15. Tr. 308, 314, 747, 768, 769-770, 874, 2445. As the Secretary observed, the issue of the

The Secretary reviewed certain studies suggesting that low exposure levels of 10 ppm and more did not cause any excess incidence of leukemia. Those studies, he suggested, suffered from severe methodological defects, as their authors frankly acknowledged.¹⁶ Finally, the Secretary discussed a study suggesting a statistically significant excess in leukemia at levels of 2 to 9 ppm. (App. 89a).¹⁷ He found that, despite certain deficiencies in the study, it should be considered as consistent with other studies demonstrating an excess leukemia risk among employees exposed to benzene. (App. 110a).

Areas of uncertainty. The Secretary examined three areas of uncertainty that had particular relevance to his decision. First, he pointed to evidence that the latency period for benzene-induced leukemia could range from 2 to over 20 years. (App. 116a). Since lower exposure levels lead to an increase in the latency period, it would be extremely difficult to obtain evidence showing the dose-response relationship between leukemia and exposure to low levels of benzene. Because there has been no adequate monitoring in the past, it would be practically impossible to determine what the exposure levels were at a time sufficiently distant so that the latency period would have elapsed. The problem was compounded by the difficulty of conducting a suitable study. Because exposure levels approaching 10 ppm had been required only recently, direct evidence showing the relationship between leukemia and exposure levels be-

tween 1 and 10 ppm would be unavailable in the foreseeable future.

Second, the Secretary observed that individuals had differences in their susceptibility to leukemia. (App. 117a). Among those exposed to benzene was a group of unknown but possibly substantial size having various "predisposing factors" whose members were especially vulnerable to the disease. (App. 118a; 184a). The permanent standard was designed to minimize the effects of exposure for these susceptible individuals as well as for the relatively insensitive (App. 184a) and also to facilitate early diagnosis and treatment. (App. 118a-119a).

The Secretary discussed the contention that a safe level of exposure to benzene had been demonstrated. From the testimony of numerous scientists, he concluded that it had not. (App. 124).¹⁸ He also found that although no dose-response curve could be plotted (App. 183a),¹⁹ the extent of the risk would decline with the exposure level. (App. 183a).²⁰ Exposure at a level of 1 ppm would therefore be less dangerous than exposure at one of 10 ppm. The Secretary found that the existing evidence justified the conclusion that he should not "wait for answers" while employees continued to be exposed to benzene at hazardous levels.

Finally, the Secretary responded to the argument that the permissible exposure level should be zero or lower than 1 ppm. (App. 185a).²¹ Even though many industries had already achieved the 1 ppm level, he found that a lower level would not be feasible. (App. 187a).

16. As to the study on which industry relied most heavily, for example, the Secretary, largely repeating the author's own admissions, observed that (1) a number of employees included in the sample may not have been exposed to benzene at any time; (2) there was inadequate follow-up of numerous employees, so that persons who may have contracted leukemia were not included in the data; (3) the diagnoses were subject to serious question, and cases of leukemia may have gone unnoticed; (4) no determination of exposure levels had been made; and (5) the occupational histories of the workers were admittedly incomplete. (App. 110a-111a).

17. Tr. 1023-1024, 1227; Ex. 154.

18. The testimony of Dr. Aksoy, one of the world's leading experts, was typical: "[E]ven one ppm causes cancer." Tr. 204. See also Tr. 30, 150, 262, 328, 363-364, 745-746, 2420, 394, 1057, 1210, 351-352, Ex. 272, p. 1.

19. Tr. 130, 360, 414-415, 416-417, 760-761, 781-782, 925, 1055-1056; Ex. 75, p. 2; Ex. 2-4, p. 11.

20. Tr. 382, 401, 405, 1372, 2846, 2842-2843.

21. Tr. 148-149 ("the permissible exposure limit should be zero") (Testimony of Dr. Aksoy). See also Tr. 1251 et seq.; Tr. 3506 et seq.

Costs and benefits. The Secretary offered a detailed discussion of the role that economic considerations should play in his determination. He observed that standards must be "feasible," both economically and technologically. In his view the permanent standard for benzene was feasible under both tests. The economic impact would fall primarily on the more stable industries, such as petroleum refining and petrochemical production. (App. 134a). These industries would be able readily to absorb the costs or to pass them on to consumers. None of the twenty affected industries, involving 157,000 facilities and 629,000 exposed employees (App. 137a), would be unable to bear the required expenditures (App. 135a). He concluded that the compliance costs were "well within the financial capability of the covered industries." (App. 163a). An extensive survey of the national economic impact of the standard, undertaken by a private contractor, found first-year operating costs of between \$187 and \$205 million, recurring annual costs of \$34 million, and investment in engineering controls of about \$266 million.²² Since respondents have not attacked the Secretary's ba-

sic conclusions as to cost, the Secretary's extensive discussion need not be summarized here.

Finally, the Secretary discussed the benefits to be derived from the permanent standard. During the hearings, it had been argued that the Secretary should estimate the health benefits of the proposed regulation. To do this he would be required to construct a dose-response curve showing, at least in a rough way, the number of lives that would be saved at each possible exposure level. Without some estimate of benefits, it was argued, the Secretary's decision-making would be defective. During the hearings an industry witness attempted to construct such a dose-response curve. Restricting himself to carcinogenic effects, he estimated that the proposed standard would save two lives every six years and suggested that this relatively minor benefit would not justify the regulation's costs.

The Secretary rejected the hypothesis that the standard would save only two lives in six years. This estimate, he concluded, was impossible to reconcile with the evidence in the record. (App. 161a).²³ He determined that, because of numerous uncertainties in the existing data, it was im-

and the duration of exposure may have been quite short for particular employees. If the duration period was short, the witness' estimate would have been much too low. (2) The witness assumed that exposure levels in the NIOSH study were around 100 ppm. The Secretary found, however, that no such assumption could be made, and there was evidence that exposure levels had generally been between 0 and 10-15 ppm. (3) The witness assumed that the dose-response curve was linear at all levels, but there was no basis for that assumption. In the case of vinyl chloride (another carcinogen for which the Secretary has promulgated exposure standards), recent evidence suggested that the dose-response curve rises steeply at low doses and becomes less steep as the levels are increased. (4) Twenty-five percent of the workers in the NIOSH study had not been found, and the witness assumed that they were still alive and would not contract leukemia. Six hundred additional workers exposed in that study were still alive; the witness assumed they too would not contract leukemia. There was considerable testimony that, for these and other reasons, the NIOSH study significantly underestimated the risk.

22. The plurality's estimate of the amount of expenditure per employee, see *ante*, at 2858, is highly misleading. Most of the costs of the benzene standard would be incurred only once and would thus protect an unascertainable number of employees in the future; that number will be much higher than the number of employees currently employed.

23. The projection, designed as an extrapolation from an amalgamation of existing studies, was dependent on a number of assumptions which the Secretary could reasonably view as questionable. Indeed, the witness himself stated that his estimate was based on "a lousy set of data," was "slightly better than a guess," Tr. 2772, and that there was "no real basis," Tr. 2719, for a dose-response curve on which the estimate was wholly dependent.

The witness' assumptions were severely tested during the hearings, see Tr. 2795 *et seq.*, and the Secretary could reasonably reject them on the basis of the evidence in the record. For example: (1) The witness appeared to assume that in previous tests leukemia had been contracted after a lifetime of exposure; the evidence afforded no basis for that assumption,

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possible to construct a dose-response curve by extrapolating from those data to lower exposure levels.²⁴ More generally, the Secretary observed that it had not been established that there was a safe level of exposure for benzene. Since there was considerable testimony that the risk would decline with the exposure level (App. 160a), the new standard would save lives. The number of lives saved "may be appreciable," but there was no way to make a more precise determination.²⁵ The question was "on the frontiers of scientific knowledge." (App. 160a).

The Secretary concluded that, in light of the scientific uncertainty, he was not required to calculate benefits more precisely. (App. 162a-163a). In any event he gave "careful consideration" to the question of whether the admittedly substantial costs were justified in light of the hazards of benzene exposure. He concluded that those costs were "necessary" in order to promote the purposes of the Act.

III

A

This is not a case in which the Secretary found, or respondents established, that no

The witness assumes that it had not. (5) The NIOSH study found a five-fold excess risk from benzene exposure; the witness assumed that the excess was much lower, despite the NIOSH finding and the testimony that that finding was a significant understatement of the risk. In light of these uncertainties, the Secretary could conclude that the witness' estimate was unsupported.

24. Witnesses testifying to the inability to construct a dose-response curve referred primarily to the impossibility of correlating the incidence of leukemia, blood disorders, and chromosomal damage with the levels and duration of exposure in past studies. Thus Dr. Herman Kraybill of the National Cancer Institute testified,

"[W]e like to estimate risk factors. This has been done, as many of you recall, with vinyl chloride several years ago. [T]o estimate the risk factors on [the basis of] experimental data, this presupposes you have good toxicity data. When I say toxicity data, I mean good dose-response data on vinyl chloride, which indeed we did have that. But with benzene, it appeared that we didn't have this situation, so therefore, most of us gave up.

benefits would be derived from a permanent standard, or that the likelihood of benefits was insignificant. Nor was it shown that a quantitative estimate of benefits could be made on the basis of "the best available evidence." Instead, the Secretary concluded that benefits will result, that those benefits "may" be appreciable, but that the dose-response relationship of low levels of benzene exposure and leukemia, nonmalignant blood disorders, and chromosomal damage was impossible to determine. The question presented is whether, in these circumstances, the Act permits the Secretary to take regulatory action, or whether he must allow continued exposure until more definitive information becomes available.

As noted above, the Secretary's determinations must be upheld if supported by "substantial evidence in the record considered as a whole." 29 U.S.C. § 655(f). This standard represents a legislative judgment that regulatory action should be subject to review more stringent than the traditional "arbitrary and capricious" standard for informal rulemaking. We have observed that the arbitrary and capricious standard itself contemplates a searching

With benzene, we sort of struck out." Tr. 760-761.

Because of the enormous uncertainties in levels and duration of exposure in prior studies, any assumptions would necessarily be arbitrary. The possible range of assumptions was so great that the ultimate conclusion would be entirely uninformative. See Tr. 360, 415, 1055-1056.

25. At one point the Secretary did indicate that appreciable benefits were "likely" to result. The Court of Appeals held that this conclusion was unsupported by substantial evidence. The Secretary's suggestion, however, was made in the context of a lengthy discussion intended to show that appreciable benefits "may" be predicted but that their likelihood could not be quantified. The suggestion should not be taken as a definitive statement that appreciable benefits were more probable than not.

For reasons stated *infra*, there is nothing in the Act to prohibit the Secretary from acting when he is unable to conclude that appreciable benefits are more probable than not.

"inquiry into the facts" in order to determine "whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment." *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402, 416, 91 S.Ct. 814, 824, 28 L.Ed.2d 136 (1971). Careful performance of this task is especially important when Congress has imposed the comparatively more rigorous "substantial evidence" requirement. As we have emphasized, however, judicial review under the substantial evidence test is ultimately deferential. See, e.g., *Richardson v. Perales*, 402 U.S. 389, 401, 91 S.Ct. 1420, 1427, 28 L.Ed.2d 842 (1971); *Consolo v. Federal Maritime Comm'n*, 383 U.S. 607, 618-621, 86 S.Ct. 1018, 1025-27, 16 L.Ed.2d 131 (1966). The agency's decision is entitled to the traditional presumption of validity, and the court is not authorized to substitute its judgment for that of the Secretary. If the Secretary has considered the decisional factors and acted in conformance with the statute, his ultimate decision must be given a large measure of respect. *Id.*, at 621, 86 S.Ct., at 1027.

The plurality is insensitive to three factors which, in my view, make judicial review of occupational safety and health standards under the substantial evidence test particularly difficult. First, the issues often reach a high level of technical complexity. In such circumstances the courts are required to immerse themselves in matters to which they are unaccustomed by training or experience. Second, the factual issues with which the Secretary must deal are frequently not subject to any definitive resolution. Often "the factual finger points, it does not conclude." *Society of Plastics Indus., Inc. v. OSHA*, 509 F.2d 1301, 1308 (CA2) (Mr. Justice Clark), cert. denied, 421 U.S. 992, 95 S.Ct. 1998, 44 L.Ed.2d 482 (1975). Causal connections and theoretical extrapolations may be uncertain. Third, when the question involves determination of the acceptable level of risk, the ultimate decision must necessarily be based on considerations of policy as well as empirically verifiable facts. Factual determinations

can at most define the risk in some statistical way; the judgment whether that risk is tolerable cannot be based solely on a resolution of the facts.

The decision to take action in conditions of uncertainty bears little resemblance to the sort of empirically verifiable factual conclusions to which the substantial evidence test is normally applied. Such decisions were not intended to be unreviewable; they too must be scrutinized to ensure that the Secretary has acted reasonably and within the boundaries set by Congress. But a reviewing court must be mindful of the limited nature of its role. See *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 98 S.Ct. 1197, 55 L.Ed.2d 460 (1978). It must recognize that the ultimate decision cannot be based solely on determinations of fact, and that those factual conclusions that have been reached are ones which the courts are ill-equipped to resolve on their own.

Under this standard of review, the decision to reduce the permissible exposure level to 1 ppm was well within the Secretary's authority. The Court of Appeals upheld the Secretary's conclusions that benzene causes leukemia, blood disorders, and chromosomal damage even at low levels, that an exposure level of 10 ppm is more dangerous than one of 1 ppm, and that benefits will result from the proposed standard. It did not set aside his finding that the number of lives that would be saved was not subject to quantification. Nor did it question his conclusion that the reduction was "feasible."

In these circumstances, the Secretary's decision was reasonable and in full conformance with the statutory language requiring that he "set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life." 29 U.S.C. § 655(b)(5). On this record, the

Secretary course above definite risk ment to so substantial revealed hu benzene exptified that been shown declined w was some leukemia, and chromo els of 10 pp ous experts required an el above 1 stated that ny—based icted by e itself be s hand evide unavailable *Light Co.*, 637, 644, 30 the Act pu from actin to the qua unavailable cy in know benefits r no reason exceeded t

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Secretary could conclude that regular exposure above the 1 ppm level would pose a definite risk resulting in material impairment to some indeterminate but possibly substantial number of employees. Studies revealed hundreds of deaths attributable to benzene exposure. Expert after expert testified that no safe level of exposure had been shown and that the extent of the risk declined with the exposure level. There was some direct evidence of incidence of leukemia, nonmalignant blood disorders, and chromosomal damage at exposure levels of 10 ppm and below. Moreover, numerous experts testified that existing evidence required an inference that an exposure level above 1 ppm was hazardous. We have stated that "well-reasoned expert testimony—based on what is known and uncontradicted by empirical evidence—may in and of itself be 'substantial evidence' when firsthand evidence on the question is unavailable." *FPC v. Florida Power & Light Co.*, 404 U.S. 453, 464–465, 92 S.Ct. 637, 644, 30 L.Ed.2d 600 (1972). Nothing in the Act purports to prevent the Secretary from acting when definitive information as to the quantity of a standard's benefits is unavailable.²⁶ Where, as here, the deficiency in knowledge relates to the extent of the benefits rather than their existence, I see no reason to hold that the Secretary has exceeded his statutory authority.

B

The plurality avoids this conclusion through reasoning that may charitably be described as obscure. According to the plurality, the definition of occupational safety and health standards as those "reasonably

necessary or appropriate to assure safe or healthful working conditions" requires the Secretary to show that it is "more likely than not" that the risk he seeks to regulate is a "significant" one. *Ante*, at 2869. The plurality does not show how this requirement can plausibly be derived from the "reasonably necessary or appropriate" clause. Indeed, the plurality's reasoning is refuted by the Act's language, structure, and legislative history, and it is foreclosed by every applicable guide to statutory construction. In short, the plurality's standard is a fabrication bearing no connection with the acts or intentions of Congress.

At the outset, it is important to observe that "reasonably necessary or appropriate" clauses are routinely inserted in regulatory legislation, and in the past such clauses have uniformly been interpreted as general provisos that regulatory actions must bear a reasonable relation to those statutory purposes set forth in the statute's substantive provisions. See, e.g., *FCC v. National Citizens Committee for Broadcasting*, 436 U.S. 775, 796–797, 98 S.Ct. 2096, 2112–13, 56 L.Ed.2d 697 (1978); *Mourning v. Family Publications Service, Inc.*, 411 U.S. 356, 369, 93 S.Ct. 1652, 1660, 36 L.Ed.2d 318 (1973); *Thorpe v. Housing Authority of the City of Durham*, 393 U.S. 268, 280–281, 89 S.Ct. 518, 525–26, 21 L.Ed.2d 474 (1969). The Court has never—until today—interpreted a "reasonably necessary or appropriate" clause as having a substantive content that supersedes a specific congressional directive embodied in a provision that is focused more particularly on an agency's authority. This principle, of course, reflects the common understanding that the determination of

Secretary indicates that he has attempted to quantify costs and benefits in the past. See 43 Fed.Reg. 54354, 54427–54431 (1978) (lead); 43 Fed.Reg. 27350, 27378–27379 (1978) (cotton dust).

It is not necessary in the present case to say whether the Secretary must show a reasonable relation between costs and benefits. Discounting for the scientific uncertainty, the Secretary expressly—and reasonably—found such a relation here.

26. This is not to say that the Secretary is prohibited from examining relative costs and benefits in the process of setting priorities among hazardous substances, or that systematic consideration of costs and benefits is not to be attempted in the standard-setting process. Efforts to quantify costs and benefits, like statements of reasons generally, may help to promote informed consideration of decisional factors and facilitate judicial review. See *Dunlop v. Bachowski*, 421 U.S. 560, 571–574, 95 S.Ct. 1851, 1859–61, 44 L.Ed.2d 377 (1975). The

whether regulations are "reasonably necessary" may be made only by reference to the legislative judgment reflected in the statute; it must not be based on a court's own, inevitably subjective view of what steps should be taken to promote perceived statutory goals.

The plurality suggests that under the "reasonably necessary" clause, a workplace is not "unsafe" unless the Secretary is able to convince a reviewing court that a "significant" risk is at issue. *Ante*, at 2864. That approach is particularly embarrassing in this case, for it is contradicted by the plain language of the Act. The plurality's interpretation renders utterly superfluous the first sentence of § 655(b)(5), which, as noted above, requires the Secretary to set the standard "which most adequately assures . . . that no employee will suffer material impairment of health." Indeed, the plurality's interpretation reads that sentence out of the Act. By so doing, the plurality makes the test for standards regulating toxic substances and harmful physical agents substantially identical to the test for standards generally—plainly the opposite of what Congress intended. And it is an odd canon of construction that would insert in a vague and general definitional clause a threshold requirement that overcomes the specific language placed in a standard-setting provision. The most elementary principles of statutory construction demonstrate that precisely the opposite interpretation is appropriate. See *e.g.*, *FPC v. Texaco, Inc.*, 417 U.S. 380, 394–395, 94

S.Ct. 2315, 2324–25, 41 L.Ed.2d 141 (1974); *Clark v. Uebersee Finanz-Korp.*, 332 U.S. 480, 488–489, 68 S.Ct. 174, 177–78, 92 L.Ed. 88 (1947). In short, Congress could have provided that the Secretary may not take regulatory action until the existing scientific evidence proves the risk as issue to be "significant,"²⁷ but it chose not to do so.

The plurality's interpretation of the "reasonably necessary or appropriate" clause is also conclusively refuted by the legislative history. While the standard-setting provision that the plurality ignores received extensive legislative attention, the definitional clause received *none at all*. An earlier version of the Act, see n. 8, *supra*, did not embody a clear feasibility constraint and was not restricted to toxic substances or to "material" impairments. The "reasonably necessary or appropriate" clause was contained in this prior version of the bill, as it was at all relevant times. In debating this version, Members of Congress repeatedly expressed concern that it would require a risk-free universe. See, *e.g.*, *ante*, at 2866–2867. The definitional clause was not mentioned at all, an omission that would be incomprehensible if Congress intended by that clause to require the Secretary to quantify the risk he sought to regulate in order to demonstrate that it was "significant."

The only portions of the legislative history on which the plurality relies, see *ante*, at 2866–2867, have nothing to do with the "reasonably necessary or appropriate" clause from which the "threshold finding"

Conservation Act). This approach demonstrates a legislative awareness of the difference between a feasibility constraint and a constraint based on weighing costs and benefits. See pp. 2902–2903, *infra*. In still others Congress has authorized regulation of "unreasonable risk," a term which has been read by some courts to require a balancing of costs and benefits. See, *e.g.*, *Aqua Slide 'N' Dive Corp. v. CPSC*, 569 F.2d 831 (CA5 1978) (construing 15 U.S.C. § 2058(c)(2)(A) [Consumer Product Safety Act]); *Forester v. CPSC*, 182 U.S.App. D.C. 153, 559 F.2d 774 (1977) (construing 15 U.S.C. § 1261(s) [Child Protection and Toy Safety Act]).

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27. It is useful to compare the Act with other regulatory statutes in which Congress has required a showing of a relationship between costs and benefits or of an "unreasonable risk." In some statutes Congress has expressly required cost-benefit analysis or a demonstration of some reasonable relation between costs and benefits. See 33 U.S.C. § 701a (Flood Control Act of 1936); 42 U.S.C. § 7545(c)(2)(B) (Clean Air Act); 33 U.S.C. § 1314(b)(4)(B) (Clean Water Act). In others Congress has imposed two independent requirements: that administrative action be "feasible" and justified by a balancing of costs and benefits, *e.g.*, 43 U.S.C. § 1347(b) (Outer Continental Shelf Land Act); 42 U.S.C. § 6295(a)(4)(D) (Energy Policy and

requirement is derived. Those portions consisted of criticisms directed toward the earlier version of the statute, which already contained the definitional clause. These criticisms, in turn, were met by subsequent amendments that limited application of the strict "no employee will suffer" clause to toxic substances, inserted an explicit feasibility constraint, and modified the word "impairment" by the adjective "material." It is disingenuous at best for the plurality to suggest that isolated statements in the legislative history, expressing concerns that were met by subsequent amendments not requiring any "threshold" finding, can justify reading such a requirement into a "reasonably necessary" clause that was in the Act all along.²⁸

The plurality's various structural arguments are also unconvincing. The fact that a finding of "grave danger" is required for temporary standards, see *ante*, at 2863, n. 45, hardly implies that the Secretary must show for permanent standards that it is more probable than not that the substance to be regulated poses a "significant" risk. Nor is the reference to "toxic substances," *ante*, at 2864, in any way informative. And the priority-setting provision, *ante*, 2865-2866, cannot plausibly be read to condition the Secretary's standard-setting authority on an ability to meet the Court's "threshold" requirement.

28. The plurality also relies on its perception that if the "reasonably necessary" clause were not given the meaning it ascribes to it, there would be no guidance for "standards other than those dealing with toxic materials and harmful physical agents." *Ante*, at 2863, n. 45. For two reasons this argument is without force. First, even if the reasonably necessary clause does have independent content, and even if that content is as the plurality describes it, it cannot under any fairminded reading supersede the express language of § 655(b)(5) for toxic substances and harmful physical agents.

Second, as noted above, an earlier version of the bill applied the "no employee will suffer" language to all substances. At that time, there was no "gap," and accordingly it could not be argued that the "reasonably necessary or appropriate" clause had the content the plurality

The plurality ignores applicable canons of construction, apparently because it finds their existence inconvenient. But as we stated quite recently, the inquiry into statutory purposes should be "informed by an awareness that the regulation is entitled to deference unless it can be said not to be a reasoned and supportable interpretation of the Act." *Whirlpool Corp. v. Marshall*, — U.S. —, —, 100 S.Ct. 883, 890, 63 L.Ed.2d 154 (1980). Can it honestly be said that the Secretary's interpretation of the Act is "unreasoned" or "unsupportable"? And as we stated in the same case, "safety legislation is to be liberally construed to effectuate the congressional purpose." *Id.*, at —, 100 S.Ct. at 891. The plurality's disregard of these principles gives credence to the frequently voiced criticism that they are honored only when the Court finds itself in substantive agreement with the agency action at issue.

In short, today's decision represents a usurpation of decisionmaking authority that has been exercised by and properly belongs with Congress and its authorized representatives. The plurality's construction has no support in the statute's language, structure, or legislative history. The threshold finding that the plurality requires is the plurality's own invention. It bears no relationship to the acts or intentions of Congress, and it can be understood only as reflecting the personal views of the plurality as to the

ascribes to it. In this light, the plurality's reasoning must be that when Congress amended the bill to apply the strict § 655(b)(5) requirements only to toxic substances, the definitional clause gained an independent meaning that in turn comprehended all standards. But surely this argument turns congressional purposes on their head. It reasons that when Congress singled out toxic substances for special regulation, it simultaneously created a more lenient ("reasonably necessary") test for standards generally, and that once that more lenient test was applicable, it somehow superseded the strict requirements for toxic substances. That reasoning is both illogical and circular. Nor is there any basis for the plurality's suggestion, see *ante*, at 2867-2868 n. 54, that the original bill's application to all standards was "entirely inadvertent."

proper allocation of resources for safety in the American workplace.

C

The plurality is obviously more interested in the consequences of its decision than in discerning the intention of Congress. But since the language and legislative history of the Act are plain, there is no need for conjecture about the effects of today's decision. "It is not for us to speculate, much less act, on whether Congress would have altered its stance had the specific events of this case been anticipated." *TVA v. Hill*, 437 U.S., at 185, 98 S.Ct., at 2297. I do not pretend to know whether the test the plurality erects today is, as a matter of policy, preferable to that created by Congress and its delegates: the area is too fraught with scientific uncertainty, and too dependent on considerations of policy, for a court to be able to determine whether it is desirable to require identification of a "significant" risk before allowing an administrative agency to take regulatory action. But in light of the tenor of the plurality opinion, it is necessary to point out that the question is not one-sided, and that Congress' decision to authorize the Secretary to promulgate the regulation at issue here was a reasonable one.

In this case the Secretary found that exposure to benzene at levels above 1 ppm posed a definite albeit unquantifiable risk of chromosomal damage, nonmalignant blood disorders, and leukemia. The existing evidence was sufficient to justify the conclusion that such a risk was presented, but it did not permit even rough quantification of that risk. Discounting for the various scientific uncertainties, the Secretary gave "careful consideration to the question of whether the[] substantial costs" of the standard "are justified in light of the hazards of exposure to benzene," and concluded that "these costs are necessary in order to effectuate the statutory purpose . . .

29. The plurality suggests that it is for the agency "to determine, in the first instance, what it considers to be a 'significant' risk," and that the agency "is free to use conservative assumptions in interpreting the data." *Ante*,

and to adequately protect employees from the hazards of exposure to benzene." App. 163a.

In these circumstances it seems clear that the Secretary found a risk that is "significant" in the sense that the word is normally used. There was some direct evidence of chromosomal damage, nonmalignant blood disorders, and leukemia at exposures at or near 10 ppm and below. In addition, expert after expert testified that the recorded effects of benzene exposure at higher levels justified an inference that an exposure level above 1 ppm was dangerous. The plurality's extraordinarily searching scrutiny of this factual record reveals no basis for a conclusion that quantification is, on the basis of "the best available evidence," possible at the present time. If the Secretary decided to wait until definitive information was available, American workers would be subjected for the indefinite future to a possibly substantial risk of benzene-induced leukemia and other illnesses. It is unsurprising, at least to me, that he concluded that the statute authorized him to take regulatory action now.

Under these circumstances, the plurality's requirement of identification of a "significant" risk will have one of two consequences. If the plurality means to require the Secretary realistically to "quantify" the risk in order to satisfy a court that it is "significant," the record shows that the plurality means to require him to do the impossible. But the regulatory inaction has very significant costs of its own. The adoption of such a test would subject American workers to a continuing risk of cancer and other serious diseases; it would disable the Secretary from regulating a wide variety of carcinogens for which quantification simply cannot be undertaken at the present time.

There are encouraging signs that today's decision does not extend that far.²⁹ My

at 2870-2871. Moreover, my Brother POWELL would not require "quantification of risk in every case." *Ante*, at 2876 (POWELL, J., concurring in part and concurring in the judgment). As I read his opinion, Mr. Justice POW-

Brother POWELL is not taking any regulatory action cannot be methods." The plurality also indicates that the Secretary's standards fits is in and n. 63. Secretary's quantification of carcinogenic risk is a deference to significant the Secretary's same regulation had not been undertaken the expert basis of risk address other international approach to agency's judgment conception performed

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Brother POWELL concludes that the Secretary is not prevented from taking regulatory action "when reasonable quantification cannot be accomplished by any known methods." See *ante*, at 2876. The plurality also indicates that it would not prohibit the Secretary from promulgating safety standards when quantification of the benefits is impossible. See *ante*, at 2871 and n. 63. The Court might thus allow the Secretary to attempt to make a very rough quantification of the risk imposed by a carcinogenic substance, and give considerable deference to his finding that the risk was significant. If so, the Court would permit the Secretary to promulgate precisely the same regulation involved in this case if he had not relied on a carcinogen "policy," but undertaken a review of the evidence and the expert testimony and concluded, on the basis of conservative assumptions, that the risk addressed is a significant one. Any other interpretation of the plurality's approach would allow a court to displace the agency's judgment with its own subjective conception of "significance," a duty to be performed without statutory guidance.

The consequences of this second approach would hardly be disastrous; indeed, it differs from my own principally in its assessment of the basis for the Secretary's decision in this case. It is objectionable, however, for three reasons. First, the requirement of identification of a "significant" risk simply has no relationship to the statute that the Court today purports to construe. Second, if the "threshold finding" requirement means only that the Secretary must find "that there is a need for such a

ELL would have permitted the Secretary to promulgate the standard at issue here if the Secretary had provided a more carefully reasoned explanation of his conclusion that the risk at issue justified the admittedly significant costs of the benzene standard. Mr. Justice POWELL also suggests that such a conclusion would be subject to relatively deferential review. *Ante*, at 2878 n. 8.

In this respect, the differences between my approach and that of Mr. Justice POWELL may be comparatively narrow. We are agreed on two propositions that I regard as critical to a fairminded interpretation of the Act: (1) the

standard," *ante*, at 2864-2865, n. 48, the requirement was plainly satisfied by the Secretary's express statement that the standard's costs "are necessary in order to effectuate the statutory purposes and to adequately protect employees from the hazards of exposure to benzene." App. 163. Third, the record amply demonstrates that in light of existing scientific knowledge, no purpose would be served by requiring the Secretary to take steps to quantify the risk of exposure to benzene at low levels. Any such quantification would be based not on scientific "knowledge" as that term is normally understood, but on considerations of policy. For carcinogens like benzene, the assumptions on which a dose-response curve must be based are necessarily arbitrary. To require a quantitative showing of a "significant" risk, therefore, would either paralyze the Secretary into inaction or force him to deceive the public by acting on the basis of assumptions that must be considered too speculative to support any realistic assessment of the relevant risk. See McGarity, *Substantive and Procedural Discretion in Administrative Resolution of Science Policy Questions: Regulating Carcinogens in EPA and OSHA*, 67 Geo. L.J. 729, 806 (1979). It is encouraging that the Court appears willing not to require quantification when it is not fairly possible. See *ante*, at 2871, and n. 63.

Though it is difficult to see how a future Congress could be any more explicit on the matter than was the Congress that passed the Act in 1970, it is important to remember that today's decision is subject to legislative

Secretary may regulate risks that are not subject to quantification on the basis of the "best available evidence"; and (2) the Secretary's judgment that a particular health risk merits regulatory action is subject to limited judicial scrutiny. It is encouraging that at least five Members of the Court accept these basic propositions.

For reasons stated in the text, however, I disagree with my Brother POWELL's conclusion that it is appropriate to hold in this case that the Act requires the Secretary to show a reasonable relationship between costs and benefits.

reversal. Congress may continue to believe that the Secretary should not be prevented from protecting American workers from cancer and other fatal diseases until scientific evidence has progressed to a point where he can convince a federal court that the risk is "significant." Today's decision is objectionable not because it is final, but because it places the burden of legislative inertia on the beneficiaries of the safety and health legislation in question in this case. By allocating the burden in this fashion, the Court requires the American worker to return to the political arena and to win a victory that he won once before in 1970. I am unable to discern any justification for that result.

D.

Since the plurality's construction of the "reasonably necessary or appropriate" clause is unsupportable, I turn to a brief discussion of the other arguments that respondents offer in support of the judgment below.

First, respondents characterize the Act as a pragmatic statute designed to balance the benefits of a safety and health regulation against its costs. Respondents observe that the statute speaks in terms of relative protection by providing that safety must be assured "so far as possible," 29 U.S.C.

30. Finding obscurity in the word "feasible," my Brother REHNQUIST invokes the nondelegation doctrine, which was last used to invalidate an Act of Congress in 1935. *Schechter Poultry Corp. v. United States*, 295 U.S. 495, 55 S.Ct. 837, 79 L.Ed. 1570. While my Brother REHNQUIST eloquently argues that there remains a place for such a doctrine in our jurisprudence, I am frankly puzzled as to why the issue is thought to be of any relevance here. The nondelegation doctrine is designed to assure that the most fundamental decisions will be made by Congress, the elected representatives of the people, rather than by administrators. Some minimal definiteness is therefore required in order for Congress to delegate its authority to administrative agencies.

Congress has been sufficiently definite here. The word "feasible" has a reasonably plain meaning, and its interpretation can be informed by other contexts in which Congress has used it. See n. 27, *supra*. Since the term is placed

§ 651(b), and by stating that the "no material impairment" requirement is to be imposed only "to the extent feasible,"³⁰ Respondents contend that the term feasibility should be read to require consideration of the economic burden of a standard, not merely its technological achievability. I do not understand the Secretary to disagree. But respondents present no argument that the expenditure required by the benzene standard is not feasible in that respect. The Secretary concluded on the basis of substantial evidence that the costs of the standard would be readily absorbed by the 20 affected industries. One need not define the feasibility requirement with precision in order to conclude that the benzene standard is "feasible" in the sense that it will not materially harm the financial condition of the regulated industries.

Respondents suggest that the feasibility requirement should be understood not merely to refer to a standard's expense, but also to mandate a finding that the benefits of an occupational safety and health standard bear a reasonable relation to its costs. I believe that the statute's language, structure, and legislative history foreclose respondents' position. In its ordinary meaning an activity is "feasible" if it is capable of achievement, not if its benefits outweigh its costs. See Webster's Third New Inter-

in the same sentence with the "no employee will suffer" language, it is clear that "feasible" means technologically and economically achievable. Under the Act, the Secretary is afforded considerably more guidance than are other administrators acting under different regulatory statutes. In short, Congress has made "the critical policy decisions" in this case, see *ante*, at 2886 (REHNQUIST, J., concurring in the result).

The plurality's apparent suggestion, see *ante*, at 2866, that the nondelegation doctrine might be violated if the Secretary were permitted to regulate definite but nonquantifiable risks is plainly wrong. Such a statute would be quite definite and would thus raise no constitutional question under *Schechter Poultry*. Moreover, Congress could rationally decide that it would be better to require industry to bear "feasible" costs than to subject American workers to an indeterminate risk of cancer and other fatal diseases.

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national Dictionary 831 (1976). Moreover, respondents' interpretation would render § 655(b)(5) internally inconsistent by reading into the term "feasible" a requirement irreconcilable with the express language authorizing the Secretary to set standards assuring that "no employee will suffer material impairment" Respondents' position would render that language merely hortatory. As noted above, no cost-benefit analysis is referred to at any point in the statute or its legislative history, an omission which cannot be deemed inadvertent in light of the explicit cost-benefit requirements inserted into other regulatory legislation.³¹ Finally, the legislative history of the feasibility requirement, see n. 8, *supra*, demonstrates that Congress' sole concern was that standards be economically and technologically achievable. The legislative intent was to prevent the Secretary from materially harming the financial condition of regulated industries in order to eliminate

risks of impairment. Congress did not intend to preclude the Secretary from taking regulatory action where, as here, no such threat to industry is posed.³²

In order to decide this case, however, it is not necessary to resolve the question whether the term "feasibility" may contemplate some balancing of the costs and benefits of regulatory action.³³ Taking into account the uncertainties in existing knowledge, the Secretary made an express finding that the hazards of benzene exposure were sufficient to justify the regulation's costs. App. 163a. Any requirement to balance costs and benefits cannot be read to invalidate this wholly rational conclusion. A contrary result, forcing the Secretary to wait for quantitative data that may not be available in the foreseeable future, would run directly counter to the protective purposes of the Act.³⁴

31. See n. 27, *supra*.

32. Congress' antipathy toward cost-benefit balancing is evident throughout the legislative history of the Act. For example:

"The costs that will be incurred by employers in meeting the standards of health and safety to be established under this bill are, in my view, reasonable and necessary costs of doing business. Whether we, as individuals, are motivated by simple humanity or by simple economics, we can no longer permit profits to be dependent upon an unsafe or unhealthy worksite." Legis.History 1150-1151 (Sen. Eagleton).

Similarly, Senator Yarborough stated: "We are talking about people's lives, not the indifference of some cost accountants. We are talking about assuring the men and women who work in our plants and factories that they will go home after a day's work with their bodies intact. We are talking about assuring our American workers who work with deadly chemicals that when they have accumulated a few year's seniority they will not have accumulated lung congestion and poison in their bodies, or something that will strike them down before they reach retirement age." Legis.History 510.

33. Nor need I discuss the possibility, raised by counsel for petitioner in oral argument, that a decision to regulate a substance posing a negligible threat to health and safety could itself be challenged as arbitrary and capricious under the Administrative Procedure Act. See Tr. of Oral Arg., at 23.

34. Respondents also rely on the statutory requirement that the Secretary may act only to prevent "material" impairment. They contend that the standard promulgated here does not fall within that category because the risk is so low. This interpretation derives no support from the statute or its legislative history. The statute itself states that standards should ensure that no employee will suffer "material impairment," not material risk of impairment.

The language is consistent with the legislative history. In an early version of the Act, the word "impairment" was modified by "any" rather than "material." See n. 8, *supra*. The feasibility and materiality requirements were added simultaneously as part of an effort to qualify the original language authorizing the Secretary to ensure that "no employee will suffer any impairment of health or functional capacity, or diminished life expectancy." Senator Dominick was concerned that the phrase "any" impairment would require the Secretary to prevent insect bites. Legis.History 345.

The respondents' construction would pose an enormous obstacle to efforts to regulate toxic substances under § 655(b)(5). The probability of contracting cancer will in most contexts be quite small with respect to any particular employee. If the statute were read to authorize the Secretary to act only to assure that "no employee will suffer material risk of impairment," the Secretary would be disabled from regulating substances which poses a small risk with respect to any particular employee but which will nonetheless result in the death of numerous members of the employee pool.

Finally, respondents suggest broadly that the Secretary did not fulfill his statutory responsibility to act on the basis of "research, demonstrations, experiments," and to consider "the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws." 29 U.S.C. § 655(b)(5). Here, they contend, the Secretary based his decision solely on "views and argument." Brief for Respondents at 52. I disagree. The Secretary compiled an extensive record composed of over 50 volumes of exhibits. Most of those exhibits are the reported results of research and demonstrations representing "the latest available scientific data." The Secretary offered a careful discussion of these data in the statement accompanying the permanent standard. His ultimate conclusions were grounded in extensive findings of fact. Where, as here, there are gaps in existing knowledge, the Secretary's decision must necessarily be based on considerations of policy as well as on empirically verifiable facts.

In passing the Occupational Safety and Health Act of 1970, Congress was aware that it was authorizing the Secretary to regulate in areas of scientific uncertainty. But it intended to require stringent regulation even when definitive information was unavailable. In reducing the permissible level of exposure to benzene, the Secretary

35. Although the Court of Appeals accepted the Secretary's finding that dermal contact with benzene could cause leukemia, it set aside the dermal contact standard because of the Secretary's failure to perform an experiment recommended by an industry witness. The failure to conduct this test, according to the court, violated the statutory requirement that the Secretary act on the basis of "the best available evidence" and "the latest available scientific data in the field."

In the hearings before the agency, respondents presented no substantial challenge to the position that benzene could be absorbed through the skin, and there was evidence in the record to support that position. Both animal and human studies had found such absorption. In these circumstances, the Secretary was not obligated to undertake additional studies simply because a witness testified that such studies would be informative. The imposition of

applied proper legal standards. His determinations are supported by substantial evidence. The Secretary's decision was one, then, which the governing legislation authorized him to make.³⁵

IV

In recent years there has been increasing recognition that the products of technological development may have harmful effects whose incidence and severity cannot be predicted with certainty. The responsibility to regulate such products has fallen to administrative agencies. Their task is not an enviable one. Frequently no clear causal link can be established between the regulated substance and the harm to be averted. Risks of harm are often uncertain, but inaction has considerable costs of its own. The agency must decide whether to take regulatory action against possibly substantial risks or to wait until more definitive information becomes available—a judgment which by its very nature cannot be based solely on determinations of fact.³⁶

Those delegations, in turn, have been made on the understanding that judicial review would be available to ensure that the agency's determinations are supported by substantial evidence and that its actions do not exceed the limits set by Congress. In the Occupational Safety and Health Act,

such a requirement would paralyze the standard-setting process. The Secretary's mandate is to act on the basis of "available" evidence, not evidence which may become available in the future.

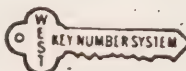
In setting aside the dermal contact standard, the Court of Appeals also relied on its conclusion that the Secretary had not shown that quantifiable benefits would result from the standard. As the discussion above indicates, the court applied incorrect legal standards in so holding.

36. See W. Lowrance, *Of Acceptable Risk: Science and the Determination of Safety* (1976); Stewart, *Paradoxes of Liberty, Integrity and Fraternity: The Collective Nature of Environmental Quality and Judicial Review of Administrative Action*, 7 *Environmental Law* 463, 469-472 (1977).

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Congress expressed confidence that the courts would carry out this important responsibility. But in this case the plurality has far exceeded its authority. The plurality's "threshold finding" requirement is nowhere to be found in the Act and is antithetical to its basic purposes. "The fundamental policy questions appropriately resolved in Congress . . . are not subject to re-examination in the federal courts under the guise of judicial review of agency action." *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 558, 98 S.Ct. 1197, 1219, 55 L.Ed.2d 460 (1978) (emphasis in original). Surely this is no less true of the decision to ensure safety for the American worker than the decision to proceed with nuclear power. See *ibid*.

Because the approach taken by the plurality is so plainly irreconcilable with the Court's proper institutional role, I am certain that it will not stand the test of time. In all likelihood, today's decision will come to be regarded as an extreme reaction to a regulatory scheme that, as the Members of the plurality perceived it, imposed an unduly harsh burden on regulated industries. But as the Constitution "does not enact Mr. Herbert Spencer's Social Statics," *Lochner v. New York*, 198 U.S. 45, 75, 25 S.Ct. 539, 546, 49 L.Ed. 937 (1905) (Holmes, J., dissenting), so the responsibility to scrutinize federal administrative action does not authorize this Court to strike its own balance between the costs and benefits of occupational safety standards. I am confident that the approach taken by the plurality today, like that in *Lochner* itself, will eventually be abandoned, and that the representative branches of government will once again be allowed to determine the level of safety and health protection to be accorded to the American worker.



William Jack HAMMETT

v.

State of TEXAS.

No. 79-5050.

July 2, 1980.

Defendant's conviction for murder and sentence to death were affirmed by the Texas Court of Criminal Appeals, 578 S.W.2d 699. After attorney filed petition for writ of certiorari, defendant filed motion to dismiss. The Supreme Court held that in absence of any issue as to defendant's competence to withdraw the petition which had been filed against his will, the motion would be granted.

Motion granted.

Mr. Justice Marshall dissented and filed an opinion in which Mr. Justice Brennan joined.

Mr. Justice Blackmun filed a dissenting opinion.

Federal Courts ⇐510

Where petitioner had moved to withdraw petition for certiorari, where state did not oppose the motion, and where there was no issue as to the petitioner's competence to withdraw the petition, which had been filed against his will, petition for certiorari to review conviction and sentence to death would be dismissed. U.S.Sup.Ct. Rule 60, 28 U.S.C.A.

PER CURIAM.

William Jack Hammett, the petitioner in this case, has been convicted of murder and sentenced to death. The conviction and sentence were affirmed by Texas Court of Criminal Appeals, 578 S.W.2d 699 (Tex.Cr. App.1979). The petitioner states, and his attorney does not deny, that he informed his counsel that he did not wish to pursue any further appeals in his case. Nevertheless, counsel filed a petition requesting review by this Court.

preserve the authority of Congress. If Congress wishes to legislate in an area which it has not previously sought to enter, it will in today's political world undoubtedly run into opposition no matter how the legislation is formulated. But that is the very essence of legislative authority under our system. It is the hard choices, and not the filling in of the blanks, which must be made by the elected representatives of the people. When fundamental policy decisions underlying important legislation about to be enacted are to be made, the buck stops with Congress and the President insofar as he exercises his constitutional role in the legislative process.

I would invalidate the first sentence of § 6(b)(5) of the Occupational Safety and Health Act of 1970 as it applies to any toxic substance or harmful physical agent for which a safe level, that is a level at which "no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to [that hazard] for the period of his working life[.]" is, according to the Secretary, unknown or otherwise "infeasible." Absent further congressional action, the Secretary would then have to choose, when acting pursuant to § 6(b)(5), between setting a safe standard or setting no standard at all.⁸ Accordingly, for the reasons stated above, I concur in the judgment of the Court affirming the judgment of the Court of Appeals.

Mr. Justice MARSHALL, with whom Mr. Justice BRENNAN, Mr. Justice WHITE, and Mr. Justice BLACKMUN join, dissenting.

In cases of statutory construction, this Court's authority is limited. If the statutory language and legislative intent are plain, the judicial inquiry is at an end. Under our jurisprudence, it is presumed that ill-considered or unwise legislation will be corrected through the democratic process; a court is not permitted to distort a statute's mean-

ing in order to make it conform with the Justices' own views of sound social policy. See *TVA v. Hill*, 437 U.S. 153, 98 S.Ct. 2279, 57 L.Ed.2d 117 (1978).

Today's decision flagrantly disregards these restrictions on judicial authority. The plurality ignores the plain meaning of the Occupational Safety and Health Act of 1970 in order to bring the authority of the Secretary of Labor in line with the plurality's own views of proper regulatory policy. The unfortunate consequence is that the Federal Government's efforts to protect American workers from cancer and other crippling diseases may be substantially impaired.

The first sentence of § 6(b)(5) of the Act provides:

"The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under this subsection, shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life." 29 U.S.C. § 655(b)(5).

In this case the Secretary of Labor found, on the basis of substantial evidence, that (1) exposure to benzene creates a risk of cancer, chromosomal damage, and a variety of nonmalignant but potentially fatal blood disorders, even at the level of 1 ppm; (2) no safe level of exposure has been shown; (3) benefits in the form of saved lives would be derived from the permanent standard; (4) the number of lives that would be saved could turn out to be either substantial or relatively small; (5) under the present state of scientific knowledge, it is impossible to calculate even in a rough way the number of lives that would be saved, at least without making assumptions that would appear absurd to much of the medical community;

"national consensus standards" under § 6(a), nor upon the Secretary's authority to promulgate "emergency temporary standards" under § 6(c).

8. This ruling would not have any effect upon standards governing toxic substances or harmful physical agents for which safe levels are feasible, upon extant standards promulgated as

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January 8, 1981

Royal Commission on Matter of Health and Safety
Arising from the Use of Asbestos in Ontario
180 Dundas Street, West, 22nd Floor
Toronto, Ontario, CANADA M5G 1Z8

Attention: Dr. J. Stefan Dupré, Chairman

Sirs:

The R. T. Vanderbilt Company Inc.'s subsidiary, the Gouverneur Talc Company, Inc. produces talc products in the United States and markets them in both Canada and the United States. We submit the following in response to the Commission's request for information on matters of safety and health arising from the use of asbestos.

Existing asbestos regulatory criteria in the United States have had an increasingly negative impact on the non-asbestos mining and mineral-processing industries. The reason for this is the use of simplistic criteria equating all particles meeting the regulatory dimensions as equally harmful. As a result, many mineral-processing industries such as crushed stone quarries, and gold, talc and taconite iron operations have been subject to unwarranted and overly strict regulation - the same regulation as applied to the mining and milling of commercial asbestos. Unless these regulations are amended or properly interpreted many more mining operations will eventually be adversely affected, since almost all of them process minerals that satisfy the criteria. (see attached comments from R. T. Vanderbilt Company, Inc. to the Ontario Ministry of Labor, in regard to proposed asbestos regulations).

VANDERBILT COMPANY, INC.

Attention: Dr. J. Stefan Dupré, Chairman

January 8, 1981

Page 2

The original, simplified criteria would be satisfactory if limited to the purpose for which they were originally intended, i.e., the regulation of commercial asbestos. However, following the concept of extrapolation of data derived from industry to situations where large numbers of persons are exposed to very low doses, the United States regulatory agencies have further compounded the problem by extrapolation of this same data to include many mineral particles for which little or no information of health hazard exists.

For these reasons it is strongly urged that the Canadian mineral science community be involved in any deliberations leading to an asbestos regulation for Ontario. In other words, we recommend that the definitions of asbestos, asbestos fiber, and the specification of the mineral particles which have brought about the health hazard situation in the first place, be developed by mineral scientists. Professor Tibor Zoltai of the University of Minnesota, in his report to the Minnesota Pollution Control Agency in regard to the Reserve Mining Company taconite deposits, puts it this way:

Unfortunately, the misuse of some relevant mineralogical concepts and terms are becoming so widespread that it may be extremely difficult to correct them. However, if that is not done, some mineralogical concepts and expressions will have double definitions: one for mineralogists and physical scientists, and one for use in environmental public health sciences and practices. The continuing use of these double definitions would be most unfortunate as it will undoubtedly lead to additional misunderstanding and conflict between mineralogists and geologists, on one side, and environmental and public health personnel on the other. As the concepts and expressions are mineralogical, the logical solution to this problem would be for the personnel in the second category to restrict themselves to the proper use of mineralogical terms.

VANDERBILT COMPANY, INC.

Attention: Dr. J. Stefan Dupré, Chairman
January 8, 1981
Page 3

Possibly the Royal Commission on Asbestos, by considering our comments can help avoid conflicts, misunderstandings and the continued litigation that have plagued the non-asbestos mineral industry in the United States for the past decade.

Sincerely,

R. T. VANDERBILT COMPANY, INC.

Allan M. Harvey

Allan M. Harvey, Director
Environmental Affairs

AMH:lsm

R. T. VANDERBILT COMPANY, INC.
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December 18, 1980

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Designated Substances Project,
Standards and Programs Branch,
Ministry of Labour,
100 University Avenue,
Toronto, ONTARIO
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Dear Sirs:

The R. T. Vanderbilt Company Inc.'s subsidiary, the Gouverneur Talc Company, Inc. produces talc products in the United States and markets them in both Canada and the United States. Since the asbestos regulations proposed by the Occupational Health and Safety Division of the Ontario Ministry of Labour, dated August, 1980, could affect the continued marketing of our talc products in Ontario we offer the following comments for your consideration.

Definition of Asbestos:

1.(a) "asbestos" means a fibrous asbestos mineral.

Comment: Since there are no non-fibrous asbestos minerals, the use of the qualifying term "fibrous" is redundant (see attached reprint form Berger and Oesper).

A suggested definition for asbestos that would not be circular is: "asbestos" means the product obtained by mining and processing primarily the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), and cummingtonite-grunerite (amosite).

(b) "fibre" means a fibre of asbestos longer than five micrometers with a length to diameter ratio not less than 3:1 as counted in a phase contrast optical microscope at 400-500 amplification.

The 3:1 aspect ratio and use of the optical microscope might have been acceptable for the purpose first intended. The United Kingdom Asbestosis Research Council in 1957 arbitrarily chose the 3:1 aspect ratio as a fibre counting limit to facilitate rejection of non-fibrous particles from airborne chrysotile asbestos particles collected on a membrane filter. (See attached explanation from S. Holmes, Former Secretary, Asbestos Research Council). In other words, a simple method of asbestos analysis would be satisfactory if limited to atmospheres known to contain predominantly the commercial forms of asbestos - chrysotile, crocidolite and amosite.

However, almost any mineral ore will produce particles with an aspect ratio of 3 to 1 or more when crushed or processed, and mineral varieties cannot be distinguished with the light microscope using phase contrast alone. As a consequence, the use of a simple fibre criterion and the light microscope to investigate workplace environments leads to erroneous "asbestos" counts when applied to many non-asbestos-containing, silicate mineral dusts. (see attached critique from Robert A. Clifton, U.S. Bureau of Mines to B. J. Pigg, January 5, 1979). Most of the hard rock mining industries of the world would be affected by this standard as proposed since serpentine and amphibole minerals are common constituents of the ores they process, either in trace or major amounts.

All the asbestos varieties listed in the proposed regulations are either serpentine or amphibole type mineral. Only under unusual and rare circumstances are these common, asbestos-forming minerals found in the asbestiform morphology, as for example in Quebec. the non-asbestiform serpentine and amphibole minerals break down readily into cleavage fragments (3:1 or better) when crushed or processed, and would be counted as "asbestos" under the definitions of the proposed regulation. A comprehensive treatment of this subject has been made by Campbell et al. in a U.S. Bureau of Mines Information Circular (No. 8751) entitled "Selected Silicate Minerals and Their Asbestiform Varieties - Mineralogical Definitions and Identification-Characterization," published in 1977 by the U.S. Department of the Interior.

If criteria to distinguish between asbestiform and nonasbestiform particles are developed, an input of considerable mineralogical science is required, and the use of much more sophisticated instrumentation than the light microscope would be mandatory. In other words, if the proposed asbestos standard is intended for the regulation of all occurrences of asbestos, even in trace amounts in mineral ores where employees might be exposed to airborne concentrations, no matter how small, appropriate definitions and methods of detection are needed in order to limit the regulation to only those mineral varieties and morphologies that have been shown to be hazardous.

There is always the question, however, of the biological response of those mineral particles which could be brought into the category of asbestos by simplistic or inappropriate definitions. Campbell et al., in a follow-up Report of Investigations/1979 (U.S. Bureau of Mines, R. I. 8367) entitled "Relationship of Mineral Habit to Size Characteristics for Tremolite Cleavage Fragments and Fibers", summed up the situation with the following statement:

The existing asbestos regulatory criteria have had an increasingly negative impact on the non-asbestos mining and mineral-processing industries. These criteria equate all particles meeting the regulatory dimensions as equally harmful, whereas there is a significant body of data indicating that only the particles having critical dimensions produce adverse effects in test animals. With minor exceptions, all of the epidemiology and most of the laboratory studies on test animals relate to exposure to commercial asbestos (chrysotile, crocidolite, "amosite," and anthophyllite asbestos). There are no comparable data on exposure to cleavage fragments of the common amphibole minerals found in many mineral-processing industries such as crushed stone quarries and gold and talc operations; currently these operations are being subjected to the same criteria as applied to the mining and milling of commercial asbestos.

In the United States, the nonasbestos mining industry has been forced to prove the negative, with costly animal and epidemiological studies designed to establish whether not all mineral particles meeting the original regulatory dimensions are as hazardous as asbestos. Although the start was slow, medical evidence to exonerate the

mineral industry has begun to appear in the published literature.

The R. T. Vanderbilt Company, one of the first nonasbestos mineral industries to be affected, commissioned Dr. William E. Smith of Fairleigh Dickinson University, Madison, New Jersey, to study the effect on hamsters of treatment with tremolite isolated from its talc ores (see attached report). The lack of carcinogenic response was the same as previously observed by Dr. Smith when the whole talc product was tested in hamsters.

To complete the investigation of its talc products the Vanderbilt Company contracted with Tabershaw Occupational Medicine Associates (Rockville, Maryland) to conduct an epidemiological study of all present and past employees of its talc operations in Gouverneur, New York, since the opening of its mine in 1948. A preliminary report has indicated that exposure to New York State talc in these operations has not resulted in an excess of lung or other cancers among its employees. A paper describing the study is scheduled for publication early in 1981.

The Reserve Mining Company of Silver Bay, Minnesota is a second example of a non-asbestos mining operation that has been severely affected by imprecise government definitions of asbestos. Allegations of asbestos in Reserve's taconite ores arose from the simple application of the 3:1 criterion to cummingtonite-grunerite particles formed during their crushing and grinding operations. These particles were alleged to be indistinguishable from amosite asbestos (according to government definition and analysis) and therefore hazardous. No medical data was offered to substantiate the government's claim.

Reserve's response to the asbestos allegations, as well as a detailed account of the effort the company has made to prove that exposure to their ores does not constitute an asbestos hazard, is set forth in an attached paper entitled "Comments on Health and Taconite", by Edward Schmid.

Another illustration of the problems imposed on the non-asbestos mining industry by inadequate asbestos definitions is the case of Homestake Mining Company, Lead, South Dakota. Like the Vanderbilt and Reserve ores, the processed mineral ingredients to which their employees were exposed were classified as asbestos by government definition. They also were forced to prove that their miners and millers were not exposed to a cancer risk. The results of a health study of miners and millers exposed to Homestake ores entitled "Mortality after long exposure to cummingtonite-grunerite" by J. C. McDonald and his colleagues at the University of McGill has been published in the American Review of Respiratory Disease, Vol. 118, No. 2, August 1978, pp. 271-77 (copy of abstract attached).

All of the above-mentioned mineral industries have been affected adversely and unjustifiably for the simple reason that insufficient attention has been paid to the development of definitions in various United States government asbestos regulations. If to put it another way, government regulations have not stipulated clearly and unambiguously that the agents to be controlled should be limited to commercial asbestos - the material on which all the health data has been collected to show a need for regulation in the first place. Since so many of the ores processed by the nonasbestos mineral industry contain mineral varieties which would fit the government's simplistic definition of asbestos, more companies will be forced to divert their resources to proving their innocence unless newly developed regulations are properly constructed.

Because of the analytical problems and erroneous counts associated with the detection and quantification of small amounts of asbestos in complex mineral mixtures, there is a growing trend among regulators to limit asbestos standards to commercial asbestos, and so stipulate in clear language. For example, the United States Department of Transportation, in its Federal Register publication (Vol. 43, No. 333, December 4, 1978) general requirements for shipment of asbestos, has clearly limited its regulation to "commercial asbestos" by the following definitions:

173.1090 Abestos.

(a) Asbestos includes any of the following hydrated mineral silicates: chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, actinolite asbestos, and every product containing any of these minerals.

(b) Commercial asbestos is any material or product containing asbestos that has commercial value because of its asbestos content.

(c) Asbestos which is immersed or fixed in a natural or artificial binder material (such as cement, plastic, asphalt, resins or mineral ore) and manufactured products containing asbestos or any materials or products whose commercial value is not dependent on their asbestos content, are not subject to the requirements of this subchapter.

Similarly, the United States Environmental Protection Agency sought to limit its national emission standards for asbestos to the commercial variety by publishing the following definition in the Federal Register, Vol. 39, No. 87 (Friday, May 3, 1974):

(h) "Commercial asbestos" means any variety of asbestos which is produced by extracting asbestos from asbestos ore.

The definition of "commercial asbestos" is added to distinguish between asbestos that is produced as a product and asbestos that occurs as a contaminant ingredient in other materials, and to make it clear that materials that contain asbestos as a contaminant only are not covered.

Dr. W. J. Hunter, Director of the Health and Safety Directorate for the Council of European Communities, has expressed his intention to limit the asbestos regulations currently being developed by the Council to commercial asbestos, or to any product or material to which asbestos has been added because of its commercial value.

3. This Regulation applies to every employer at a work place where asbestos is present, processed, mined, used, handled or stored and at which a worker is likely to inhale or ingest asbestos.

Comment: This paragraph should be changed to read: "this Regulation applies to every employer at a workplace where commercial asbestos or materials containing more than one percent by weight intentionally added asbestos is present, processed, mined, handled or stored and at which a worker is likely to inhale or ingest asbestos."

The argument for stipulating "commercial" asbestos has been presented above. The exclusion level of one percent by weight gives recognition to the state of the art in methodology for detection and quantification of asbestos in mixtures, and recognizes the presence of insignificant quantities of asbestos.

In paragraph 3 of the proposed Ontario regulation no allowance is given for the presence of trace quantities of asbestos in products or the environment. To a certain extent it is similar to the stipulation in the United States OSHA asbestos standard where medical exams were required for workers exposed to "concentrations of asbestos", without designating a lower limit. In other words, any concentration of asbestos above zero triggered the medical requirements.

Since asbestos is ubiquitous in the environment as a natural contaminant and can be found in trace concentrations in natural water supplies, urban ambient air and in most mineral products, OSHA amended the original standard to exclude atmospheres containing less than 0.1 asbestos fibers per ml.

Similarly the U.S. Environmental Protection Agency has adopted a practice of excluding from its National Emission Standards for Asbestos, materials containing 1 percent by weight or less asbestos. And finally, the American Society for Testing Materials, in its E-34 Committee Proposed Standard for Occupational Exposure to Asbestos, has eliminated the need for regulation of materials contaminated with trace quantities of asbestos by limiting the asbestos caution label to products containing more than one percent asbestos on a dry weight basis.

We trust that these comments will assist the Standards and Programs Branch in development of appropriate regulations for control of occupational exposure to asbestos. We will be pleased to provide additional materials in support of the recommendations at your request.

Sincerely,

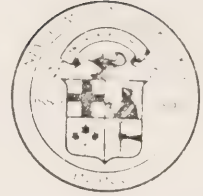

Allan M. Harvey, Director
Environmental Affairs

10

Ontario Medical Association

240 St. George Street
Toronto, Ontario
M5R 2P4
416 925-3264

OMA Centennial
1880-1980



January 14, 1981.

Royal Commission on Asbestos,
180 Dundas Street West,
22nd Floor,
Toronto, Ontario,
M5G 1Z8.

Dear Sirs:

RE: ASBESTOS IN PUBLIC BUILDINGS

The O.M.A. Committee on Public Health wishes to submit the following statement on asbestos in public buildings to the Royal Commission:

"Asbestos is ubiquitous and dangerous, and control of the health hazard it presents should not be left solely to industrial safety experts, engineers and those involved in construction and other industries. The medical profession has an important role to play, and public health physicians and the Ontario Medical Association should have a higher profile in the control of its use and in dealing with the environmental aspects of past use. Nevertheless, a cautionary note to avoid creating anxiety without the ability to provide effective solutions should be kept in mind."

The Committee would be grateful for the opportunity to expand on these comments at a public hearing, during the month of April if this timing was possible. It is hoped that by this time we can present an official position from the Ontario Medical Association as opposed to simply the views of the Association's Public Health Committee.

Thank you very much for this opportunity.

Sincerely,

John Krauser, M.A.
Secretary,
Committee on Public Health.

JK:pb

11

AMERICAN
INDUSTRIAL
HYGIENE
ASSOCIATION

Ontario Local Section
PO Box 1232, Station Q, Toronto, Ontario, M4T 2P4

January 12, 1981

Royal Commission on Matters Arising
From the Use of Asbestos in Ontario
180 Dundas Street West
22nd Floor
TORONTO, Ontario
M5G 1Z8

Attn: Dr. J. S. Dupré

Dear Dr. Dupré:

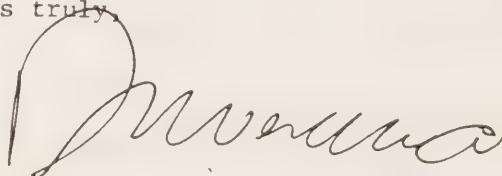
Enclosed, please find eight copies of our submission concerning matters of health and safety arising from the use of asbestos in Ontario. This submission has been prepared by an Ad-hoc committee, of the Ontario Section, American Industrial Hygiene Association.

In preparing this submission, the committee members have consulted several other members who are considered to have expert knowledge in the field of asbestos.

The opinions and judgement expressed in this document thus reflect an extensive background of knowledge and experience of the individuals consulted and the committee members.

We are pleased to have had the opportunity to make our views known to the Commission and we are prepared to discuss our submission.

Yours truly,



Dave K. Verma, M.Sc., Ph.D., P.Eng., C.I.H.
Chairman - Royal Commission on Asbestos
Ad hoc Committee

AMERICAN
INDUSTRIAL
HYGIENE
ASSOCIATION

Ontario Local Section
PO Box 1232, Station Q, Toronto, Ontario, M4T 2P4

SUBMISSION TO THE
ROYAL COMMISSION ON MATTERS OF
HEALTH & SAFETY ARISING FROM THE
USE OF ASBESTOS IN ONTARIO

BY

"ROYAL COMMISSION ON ASBESTOS AD HOC COMMITTEE"

ONTARIO SECTION,

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION

DR. D.S.L. BLACKWELL -- MEMBER

MR. A.A. KERR -- MEMBER

DR. D.K. VERMA -- CHAIRMAN

The members of the "Royal Commission of Asbestos Ad hoc Committee" of Ontario Section, American Industrial Hygiene Association (A.I.H.A.), are pleased to have the opportunity to submit this brief.

With a membership of approximately 250, the Ontario Section of A.I.H.A. is comprised of Industrial/Occupational Hygienists, Occupational Health Nurses, and Physicians representing industry, Government, Universities and Unions of Ontario. Our objectives are:

1. To promote the study, evaluation and control of environmental stresses arising in or from the workplace or its products, in relation to health or well-being of workers and the public.
2. To increase the knowledge of industrial/occupational health through interchange and dissemination of information to bring together persons interested in various phases of industrial/occupational health.
3. To promote the profession through the encouragement of interest within and co-operation with Governmental, industrial, educational and other professional bodies.

We feel duty bound, as the professionals, knowledgeable in the recognition, evaluation and control of potential health hazards of asbestos, to support the Commission in its task.

Our submission will first address the issues outlined by the Commission and then present our recommendations.

COMMENTS ON THE ISSUES

I : Health Effects of Asbestos

1. We believe that asbestos exposure can cause asbestosis, mesothelioma, lung cancers and cancers of other sites. Inhalation of asbestos is the main route of exposure, but it should be kept in mind that ingestion of asbestos may have some effects that have not yet been proven.
2. We believe that various forms of asbestos have different degrees of toxic effects, especially in relation to cancers and mesothelioma. Among the commercially significant forms, Crocidolite is the most hazardous followed by Amosite which is followed by Chrysotile.
3. We believe that in most cases there is a low level exposure that can be considered acceptably 'safe'. For example, in occupational exposure situation, there is ample evidence to support the existence of a threshold level for the prevention of asbestosis and most cancers. In this regard we believe in the concept of the Threshold Limit Value (TLV's) which is defined by the American Conference of Governmental Industrial Hygienist (ACGIH) as:

"Threshold limit values refer to airborne concentrations of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effects. Because of wide variation in individual susceptibility, however, a small percentage of workers may experience discomfort from some substances at concentrations at or below the threshold limit; a smaller percentage may be affected more seriously by aggravation of a pre-existing condition or by development of an occupational illness."

The TLV Committee of ACGIH has explicitly stated that the recommended

I : Health Effects of Asbestos (cont'd)

levels are based on the best available evidence, and that they will provide protection to the majority of exposed population but not absolute protection to all of the exposed population. There is, therefore, a very small degree of acceptable risk involved. This concept of the TLV's we believe, is applicable to asbestos as it is to many other chemicals and hazardous agents in work places.

4. We feel that the proposed Ontario Regulation regarding occupational exposure to asbestos if attained would provide adequate protection in most occupational situations. They are:

Chrysotile	1.0 fibres/cc
Amosite	0.5 fibers/cc
Crocidolite	0.2 fibers/cc.

5. We believe that there is a definite potential of higher risk for asbestos workers because they are in the direct contact of asbestos process where potential exposure to airborne asbestos is high. It has been also shown that asbestos workers who smoke, have a much higher risk of developing asbestos related cancers.
6. We believe that there may be under certain circumstances, some potential health risk in the offices and buildings sprayed with asbestos. The degree and extent of hazard is dependant upon such factors as type and condition of spray material, where found, type and amount of asbestos, and its potential of becoming airborne.
7. We feel that the age of exposed individual could have a definite bearing on the health risk. It is especially true in relation to

I : Health Effects of Asbestos (cont'd)

young children because of two factors:

1. long latent period
2. morphology of lung structure.

There is some evidence that a child's lungs may preferentially retain those long and thin fibers that are considered more carcinogenic.

8. We believe that there is no health risk from asbestos exposure found in the outside air (excluding air in the neighbourhood of asbestos mines or an asbestos plant) in cities, towns and rural areas.

II : The Exposure of Asbestos Workers

1. Asbestos exposure has occurred in many industrial and occupational settings. They included insulation, cement pipe industry, spraying of asbestos, brakeline manufacturing, taping, texturing, construction industry, asbestos cutting, etc. We feel that the Commission can obtain much of the exposure information from respective sources, e.g. Governments, Industry, Contractors and from published literature. However, good reliable occupational exposure data would be difficult to gather. The asbestos monitoring was not widely carried out in past because the manitude of the hazard was not realized.
2. Good industrial hygiene practice e.g. local exhaust ventilation, personal protection, proper work procedure will reduce exposure to asbestos. Technology is, thus, available for control of the hazard.
3. ~~Many substitutes for asbestos are on the market and they are generally much safer than asbestos.~~ Insulation material, is a case in point where now almost all insulation is asbestos free. Man-made mineral fibers (MMMF) e.g. glass fibres, mineral fibres etc., have been used as a substitute for asbestos and appear to present no hazard. Very fine and long fibres have however shown to produce tumors, when implanted in experimental animals. No such tumors have been shown to occur in humans occupationally exposed to MMF. This is perhaps due to the defence mechanisms of the human respiratory system.
4. The danger of not using asbestos, where there is no suitable substitute, is that it may result in loss of life and property due to such occurances as fire and automobile brake failure. In many products asbestos is indispensable, e.g. brake lining.

III : Asbestos in Public Buildings

1. Many of the comments applicable to this section has been given earlier in Section I.
2. In general there is no health hazard from asbestos (e.g. sprayed on insulation and fireproofing) in buildings; offices, auditoriums, theaters etc. Under certain circumstances, however, due to the nature of the spray , condition of the spray, type and amount of asbestos, its physical state, it may present a risk if it became airborne.
3. In case of schools, we recommend prudence and suggest that they be given special consideration. This is because of, as stated earlier, the asbestos exposure which would be quite safe for adults, may not be safe for young children. Technology is available for removal and encapsulation of asbestos to minimize and eliminate exposure in schools. Pros and Cons of encapsulation, removal or leaving it intact in place should be considered. An industrial hygienist or person specially trained in such evaluation should be consulted in the evaluation and further disposition of such problems.
4. The evaluation of exposure in schools and buildings should be based on visual inspection and bulk sample analysis.
5. The action should be initiated at the local level (School Board, municipality, etc.). We believe that local agencies should seek advice from trained personnel.

IV : Other Asbestos Exposure

1. There are many occupational situations where significant asbestos exposure has occurred. Some of these exposures have not been identified or properly documented. Consequently there is a lack of exposure data. Many such groups were never under medical surveillance designed for asbestos workers. These include such occupations as:

- Construction
- Maintenance
- Public Utilities (Water Works)
- Drywall
- Fireproof Spraying
- Service (Auto Repairs)

It should be kept in mind that many of these groups could have asbestos related diseases and could be misconstrued as not being work related.

2. Asbestos should be removed from future consumer products e.g. oven mitts, ironing board covers, furnace filter, humidifier plate, etc.
3. Consumer should be informed of incidental asbestos exposure encountered during such use as cutting of asbestos board. The information process to the consumer (i.e. general public), should be realistic and constructive. If not done properly, it could be counter productive. Some agencies, perhaps Corporate and Consumer Affairs of Federal Government should initiate programs of eliminating asbestos from household products.

V : Institutional and Policy Issues

1. There are several federal and provincial governmental agencies that are involved. We believe regulations and guidelines are necessary but in order to reach the larger segment of small companies and employees, a suitable education program is equally important. The federal and provincial governments should be responsible for the initiation of such educational programs.

VI : Measurement

1. The membrane filter method, involving fiber counting at 400 to 500 times magnification using phase contrast optical microscopy is the present preferred method of choice for the occupational exposure evaluation.
2. For the evaluation of asbestos exposure inside the building and schools, the method of choice is:
 - a. visual inspection of type and condition of spray, friability, water damage, potential of becoming airborne; and
 - b. analysis of bulk samples to determine type and amount of asbestos.

The factors involved in a visual inspection can easily be incorporated in some sort of a rating number, (e.g. E.P.A. number, Ferris Index, etc.).

Air sampling should not be a routine component of the evaluation.

Where air samples have been taken the results should not be the sole basis for any decision. It should be used only as an additional factor in the decision making. Electron microscopic technique for the measurement, provides precise information as to the fibre levels. There is however, no study relating such levels to the health effects. We therefore suggest, the use of electron microscopic technique for airborne fibers in public buildings and schools for the purpose of gathering data for its future use in health studies.

RECOMMENDATIONS

In light of the preceeding comments, the information and experience at hand, we recommend:

1. That asbestos exposure in the workplace be controlled as low as reasonably achievable below the suggested occupational exposure guidelines by good industrial hygiene practices incorporating substitution, engineering control, personal protection, personal hygiene.
2. That the advise of an industrial hygienist, or persons trained in evaluation of such exposure should be sought wherever possible.
3. That the occupational exposure standard proposed, under the Occupational Health and Safety Act of Ontario be accepted as a suitable guideline at this time.
4. That the membrane filter method of fiber counting using phase contrast microscopy be accepted as the method for asbestos evaluation in occupational exposure situations.
5. That the workers occupationally exposed to asbestos should be under an appropriate medical surveillance program.
6. A preliminary asbestos exposure evaluation program be initiated in all industrial and construction facilities in Ontario to identify, the extent and the degree of asbestos hazard. This is to include such not widely known occupations as: contruction, maintenance, public utilities(water works), drywall, fireproof spraying, service (auto repairs).

RECOMMENDATIONS

7. That persons occupationally exposed to asbestos should not smoke and those who do should be strongly encouraged to stop smoking.
8. That an educational program be initiated for any occupationally exposed group of workers. This is to include information on health hazards, control, medical monitoring, exposure limit, record keeping etc.
9. That the school environment be given a special consideration. The airborne asbestos exposure in the schools should be minimized or eliminated by remedial measures, e.g. removal, encapsulation or continued inspection.
10. That no environmental exposure limit be set for public buildings, schools, etc. Visual inspection, analysis of bulk samples coupled with professional judgement should form the basis for necessary action.
- 11.. That air sampling be carried out in buildings and schools for the purpose of gathering data that can be used in the future assessment of health effects of such exposure.
12. That research work be encouraged to correlate evaluations of asbestos in buildings and schools using various available techniques, e.g. phase contrast optical microscopic technique, polarizing microscopic technique, electron microscopic technique, magnetic alignment technique, etc.
13. That research work be encouraged and supported in the area of epidemiological studies, and pathological sample studies (lung content) involving low level exposure in the public buildings and schools. Epidemiological studies may not be feasible because of many other

RECOMMENDATIONS

- conflicting variable but the feasibility should be examined.
14. That under normal circumstances no guidelines are needed for outside air. There should, however, be an environmental guideline for areas surrounding the immediate vicinity of mining, milling, and asbestos processing industries.
 15. That the use of asbestos in the consumer and household goods should be eliminated. A consumer education program should be initiated to inform the general public of the extent and relative potential hazard from airborne asbestos exposure.

12

BRIEF TO THE ROYAL COMMISSION
ON MATTERS OF HEALTH AND
SAFETY ARISING FROM THE USE
OF ASBESTOS IN ONTARIO.

FROM

THE HAMILTON AREA OCCUPATIONAL
HEALTH AND SAFETY COMMITTEE
OF HAMILTON LABOUR COUNCIL

Tel: 811-547-2944

The Hamilton Area Occupational Health and Safety Committee of Hamilton Labour Council joins other labour organizations in submitting a brief to the Royal Commission on Asbestos.

The principal issue we wish to raise is the question of the need for a commission such as this at this time. Surely no one will need persuasion in 1981 of the dangers of asbestos; these are voluminously documented and will not be reiterated in this brief. All that remains to be determined is how many kinds of cancer will ultimately be found to be associated with asbestos. In the face of these facts, it is obvious to us that the strategy that must be adopted is one aimed at elimination of asbestos from our working and living environments. However, the Commission has assumed a stance of inquiry into these matters with a view to discussion of "safe" levels of exposure, cost-benefit issues and "levels of acceptable risk."

Consequently, we doubt the utility of our presenting our point of view in the arena of a different kind of debate. Previous hearings and inquiries have failed to result in a policy concretely directed at elimination of environmental asbestos. The views of labour have been given only token recognition. Workers and their families continue to pay with their lives for the government's failure to give health and life priority over productivity and profits.

Through direct efforts by working people, some advances have been made. After a prolonged struggle by library workers in Hamilton, premises at 220 Dundurn Street South in which asbestos was continuously flaking from the ceiling, were closed down. The workers, along with classes for retarded children, were moved to other locations. This victory

spurred the investigation of asbestos in schools across Ontario. However, there are many similar workplaces in Hamilton in which it has been impossible to obtain changes because standards have been applied to them which were devised (by flawed methodology) only to prevent asbestosis in asbestos workers. So, for example, non-asbestos workers in a shop in which every movement on the floor above caused a shower of asbestos, have been told that airborne levels are below the TLV; thus, there is no need for concern and no basis for action.

~~Our position is that there is~~ no safe level or form of exposure to this carcinogen. We refuse to gamble with the lives of workers and their families by being party to interminable discussions of so-called "safe levels", cost-benefit issues and the usefulness of medical monitoring.

All too frequently in the past, debates have centered on scientific and technical issues - debates which can ultimately be reduced to the question of how many workers will die at different levels of exposure. The scientific fascination and curiosity about these questions might be better channeled into a consideration of how we eliminate asbestos from our working and living environments.



Labour Council of Metropolitan Toronto

President **WALLY MAJESKY**

Secretary **PETER HITCHEN**

January 14, 1981

Professor S. Dupre, Chairman
The Royal Commission on Asbestos
180 Dundas St., West,
22nd floor
Toronto, Ontario. M5G 1Z8

Dear Sir:

Enclosed you will find a brief, outlining our thoughts on asbestos and past and present problems associated with the control of this mineral with a special emphasis on the use of cost-benefit analysis as a basis for health and safety regulation.

As you are probably aware, the Labour Council of Metropolitan Toronto is the central labour body for Ontario's largest community. We currently represent more than 200,000 workers, most of whom will encounter asbestos as part of their jobs. It may be an asbestos exposure unrelated to their job (eg. asbestos exposure in the schools) or it may be a part of their everyday work (eg. maintenance workers removing asbestos lagging). These workers are employed by both large and small employers and they are members of both large and small union organizations. We also see as part of our responsibility to our community, the need to represent the interests of those who do not yet have the benefits of union representation.

For all these reasons we seek standing before the Royal Commission. We believe the content of our brief indicates our knowledge and experience with the problems of asbestos while our responsibilities as a worker's organization shows our desire and continuing responsibility to help ensure the removal of hazards from the workplace and the community.

Yours sincerely,



Wally Majesky,
President

/enc1.

SUBMISSION OF
THE LABOUR COUNCIL OF METROPOLITAN TORONTO
to

ROYAL COMMISSION ON MATTERS OF HEALTH AND
SAFETY ARISING FROM THE USE OF ASBESTOS IN
ONTARIO

JANUARY, 1981

It would be incorrect Mr Chairman and members of the Commission to tell you that we welcome this opportunity to make our views known on the matter of asbestos. Indeed we believe that our concerns regarding this mineral are well known. It is our belief that we and you and all other presenters are engaging in an exercise that is designed to at best delay any decision about asbestos and at worst to avoid making the hard political choices that need to be made.

It is unlikely that this Royal Commission will find any new hidden truths about asbestos. The scientists who minimize the dangers have published their work. The scientists who argue that no safe levels exist for carcinogens have also placed their views before the public. The Royal Commission will hear testimony from those who have made fortunes from asbestos and understandably, from their perspective, would like to continue to earn those profits. Unions and central labour bodies have also made their fears about the asbestos slaughter public prior to this Commission's formation. This Labour Council in its Health and Safety Newsletter Health Alert published a fact sheet on asbestos a number of years ago. The second issue in October 1976 was devoted to this substance. Almost everyone will be represented before the Royal Commission: industry, government, the professions will undoubtedly appear, medicine, engineering, and the rest, the unions will also be present. The public will appear as will the survivors of asbestos exposure. You will undoubtedly hear from widows and from those suffering asbestosis or asbestos induced cancer and their testimony will speak to the

real issues before this Commission, but our brothers and sisters who have died will not be here. Their unknown numbers bear mute testimony. They cannot relate to the commissioners the stories of their shattered lives and dreams. Their agony was private, shared by their families, friends and co-workers.

Neither we nor you can do anything for them. For them it is too late -- all that remains are the memories. Our comments reflect those memories. Our bitterness reflects their pain. Our cynicism reflects the fact that their deaths were unnecessary and avoidable because those who sent them to die, knew.

We present the Commission with our comments not because we believe the Commission will solve the problems of asbestos. Indeed, we believe that when all the arguments have been made, when the political heat has been reduced, when it is convenient, the Commissioners will recommend that the economic costs of doing what needs to be done are too high. The scientific arguments which justify what is deemed to be the economic need will be accepted. We expect that dollars will be given more value than lives.

Our concern about Royal Commissions like this one are even broader. If the asbestos Royal Commission is the first of a series, if next year we are back to discuss vinyl chloride, and after that benzene, then coke oven emissions, acrylonitrile, perchloroethylene and the many other chemicals and physical agents which are hazards both in the occupational and general environments, then we will have time for nothing else.

The piecemeal approach is patently absurd. We need to evolve methods in this society which can deal with the hazards "industrial progress" has given and continue to give us and our children. We are not prepared to say that the carcinogens policy proposed in the United States is the way in which Ontario and Canada should proceed. We are, however, convinced that a never ending series of Royal Commissions will serve only the interests of those who wish to see as little as can be defended, done.

If this Royal Commission does not include as part of its recommendations a method for dealing with current and future hazards of major proportions then even if we are surprised and the commission does make progressive and useful proposals about asbestos the exercise will still be a failure.

The people of this province, while they need an organized policy for asbestos, need more than that. They need a comprehensive policy for the determination of how this society should begin to deal with the incredible store of environmental hazards.

Asbestos is not a new hazard. It is not some amazing revelation of the 1980's that asbestos makes people sick. It is not a revelation of the 1980's that asbestos causes illness in significant numbers of people. It is old knowledge even if it has not always been public knowledge. In 1900 a physician in London diagnosed the first case of asbestosis and by 1935 medical records officially recognized 28 asbestosis cases. In 1918 insurance companies in both the United States and Canada stopped

selling personal life insurance policies to asbestos workers. By 1935 the first link between asbestosis and lung cancer had been reported and 7 years later in 1942, ten cases had been officially reported and recognized.

One study published in 1935 looked at 126 asbestos workers in Canada and the U.S. Sixty-seven were classified as having asbestosis, 39 were listed as doubtful and only 20 were diagnosed as being completely free of asbestosis. These findings indicated 84 per cent of the workers had some signs of disease (53 per cent positively diagnosed) while only 16 per cent showed no signs of the disease. Of the total of 126, 96 workers or 79 per cent complained of persistent coughing or shortness of breath, which are typical early symptoms of asbestosis. Clearly an epidemic! More than 50 per cent and perhaps as high as 84 per cent of a group of asbestos workers were found to have this crippling lung disease. Why not a Royal Commission in 1935? Why no public outcry or debate? The answer should note that the information was neither given to the public nor the workers. Indeed, even if it had been available, its conclusions and the conclusions of the authors minimized the hazards. They reported that the workers appeared healthy and that they were not disabled. They also suggested that the symptoms described by the workers were subjective and therefore should not be given too much emphasis.

While the report was not suppressed, the public was not put on alert. The same cannot be said for the asbestos companies. The

workers tested were mostly employees of Johns-Manville. It is inconceivable that the company would not have received a copy of the study and understood its implications. Were the plants cleaned up? Were the workers protected? Were they even informed of the conclusive evidence that their work caused disease? Information clearly does not imply action. This study serves only as one example of how the companies ignored the information which they either had or had access to.

Industry tactics took a number of turns. First they ignored the reports of asbestosis. When the first reports of lung cancer were made, industry dismissed the reports as not indicative, they were after all only case studies, not randomly selected, the individuals might have been especially susceptible to lung cancer. Clearly what was needed was a long term study or an analysis of the health records of current asbestos workers. Either of these activities were within the power of industry, such action was not however, in the interest of an expanding and profitable industry. By 1955 a British study had found an unusually high rate of lung cancer among asbestos workers. The industry had to respond to the growing evidence of the links between their product and cancer.

What then began, is, we believe a history of denial, obfuscation and downright deceit which was sponsored, bought and paid for by the asbestos industry.

By 1960, medical research on asbestos was at a watershed. By then a total of 63 papers on the subject had been published

in the U.S. and Canada and Great Britain. The 52 papers not sponsored by industry,... by hospital and medical school staff, indicated asbestos as a cause of asbestosis and lung cancer. The 11 papers sponsored by the asbestos industry presented polar opposite conclusions. They denied that asbestos caused lung cancer and minimized the seriousness of asbestosis. (1)

One of the most important industry tactics was to ignore the latency period. The studies they sponsored would look at large groups of workers irrespective of their age or length of service in the industry.

The early 1960's caused new problems for industry. The disease mesothelioma was added to the list caused or suspected of links to asbestos. This was found not only among workers but also in their families. Asbestos was being recognized as an environmental not just a workplace hazard. In addition, Dr. Irving Selikoff and his colleagues at Mt. Sinai Medical Centre completed their major study based on the records of an asbestos workers union.

Asbestos was now not only an important but a recognized hazard. Industry was beginning to take the issue much more seriously -- the threat to profits was increasing, too many people were finding out about too many health problems. While industry sponsored only 11 studies in the previous 30 years, the years since 1960 have seen the output climb dramatically, more than 30 studies to 1975.

The problem of latency period did not disappear in these new studies nor was it treated in a new way. The prime example of

the new studies was funded by the Quebec Asbestos Mining Association and carried out by J. Corbett McDonald of McGill University. The failings of this research are now well documented and well known but they fall into a pattern that should neither be forgotten nor ignored.

As the manipulation of latency period became too well known a dodge, new theories (excuses) were needed. One of the first of these was that the problem was not asbestos rather the problem was trace metal contaminants in the asbestos. (While this theory was finally rejected, we see little difference for those who died in arguments about whether the problem was asbestos or its impurities!)

Perhaps the most absurd explanation of the source of asbestos related disease suggested that the polyethylene bags in which the asbestos was stored were contaminating the product.

Another theory, and one which has current proponents is the theory that there is "good" asbestos and "bad" asbestos. It is not surprising to us that the "good" asbestos just happens to be mined and most commonly used in North America. We cannot say that there are not differences between the abilities of the various types of asbestos to induce disease, but frankly we don't care. We don't care because all asbestos induces disease, all asbestos causes cancer, all workers exposed to asbestos of whatever type have an increased risk of disease.

Another current and even more damaging argument is that the asbestos disease was caused in the bad old days when there were no adequate standards or protections for workers. It is a neat turn on the use of latency as an argument. Before latency was ignored, now it is used to explain continuing high, epidemic levels of disease among asbestos workers. From our perspective the most insidious implication of this theory is that we will have to wait another 20 or 30 years to be sure if the theories are right or wrong.

We say enough. According to reputable scientists "... it is known that asbestos fibres have been demonstrated to be carcinogenic to man (sic) at all fibre concentrations studied under adequate epidemiologic method". (2)

Further, reputable scientists agree that it is not possible to determine safe levels of exposure for substances which cause cancer.

There is no known method for measuring or predicting a "safe" level of exposure to any carcinogen below which cancer will not result in any individual or population group. That is, there is no basis for the threshold hypothesis which claims that exposure to relatively low levels of carcinogens is safe and, therefore, justifiable. (3)

It is not useful for us to engage in arguments about whether white is less hazardous than blue. It is not helpful for us to argue that a 2 fibre standard is not as good as a standard of .01 fibres when we believe that no exposure is safe. There

are a phenomenal number of potential technical arguments which can be made, investigated, proven or disproven. All of that takes time. Those who are already the victims don't have the time to wait. Nor do those who are waiting to take their place on the firing line have time for further studies. They are, and this will be said numerous times during the course of this commission, the experimental rats of today's science.

It is important to recognize that the push for further studies, while it may be based on a scientific impulse to seek "truth", it is also based on a conceptual framework that considers chemicals safe until they have been proven to be harmful. It is a basic tenet of our system -- innocent until proven guilty. Therefore, proof, irrefutable proof is required before asbestos and those who profit from it can be penalized. Penalty in this instance is further control or a ban on asbestos with the corresponding loss of profitability.

The premise that "innocent until proven guilty" should apply to chemicals as well as people is nonsense. People are treated in this way because our society, at least in theory, believes that it is better for the guilty to go free than it is for the innocent to be punished. We believe this presumably because the consequences of a mistake are, on balance, worse, if for example, an innocent woman was executed because of an error in the judicial system than a guilty man be set free through a similar error. With chemicals the situation is clearly reversed. On balance it is infinitely better for chemicals to be banned until

they are proven safe for any particular use.

While we are fully aware of the problems which have plagued other regulatory agencies in their search for pesticides or pharmaceuticals which have been proven safe, the record in these areas is infinitely better than in the workplace. This is not to suggest some form of paper regulation which will make us feel better because the law requires pre-testing or confirmation of safety. What we want and what society needs are real and enforced methods of control on those who would manufacture, mine, process or sell hazardous products in all forms. For it is a mistake to look only at the chemicals or substances. People are also involved in the process. Asbestos has always been hazardous, perhaps in earlier times people died too soon so there were few cases of lung cancer or asbestosis, but the potential was always there. After the knowledge of the hazards of asbestos became known is it legitimate to ask about the guilt of asbestos? It is more reasonable to consider the guilt of those who profited from the ever increasing and continuing use of asbestos and the failure to seek safer alternatives.

At the outset of this brief we expressed our concern that the Royal Commission would, in the final analysis, base its decision on the economic side of the question. We believe that the recommendations will follow the new religion known alternatively as cost-benefit or risk-benefit analysis. We are not economists and we reject an economic basis as the framework for decisions on asbestos. We are talking about more than dollars, we are talking about the fundamental right of working people to live.

While we are not prepared nor able to argue about the specifics of any cost-benefit or risk-benefit equation we do have some comments about the procedure itself and how it applies to the regulation of health hazards in general and the asbestos hazard in particular.

A representative of a public interest group in the United States, where the cult of cost-benefit analysis has its most sophisticated followers and critics, has observed that the "abolition of slavery or child-labour laws would never have passed a cost-benefit test." (4) Another critic described it as the "invention of those who do not wish to regulate, or to be regulated ... its primary use in government decision-making is to avoid taking action which is necessary or desirable in order to truly protect the health of the public or the integrity of the environment." (5) Another has described the entire approach as nothing more than scientific pornography, (6) and

a committee of the U.S. Congress concluded that "the limitations of use of cost-benefit analysis in the context of health, safety, and environmental regulatory decision-making are so severe that they militate against its use altogether."(7)

Yet it is still an issue. We feel obliged to do what we can to ensure that this Royal Commission cannot simply accept as reasonable the application of cost-benefit analysis in determining what actions are needed to protect workers and the public from a continuing asbestos epidemic. Our limited knowledge of the methods of cost-benefit accountants lead us to the conclusion that the system developed from the profit and loss accounting used in business. That system allows an entrepreneur to assign dollar values to the costs and benefits of various alternative actions and thereby allow him/her to maximize the return on investment. The maximization of profits being the ultimate goal for business in our society and a necessary factor in a business's continued survival. While we are not convinced that the methodology has yet been successfully applied in any area of social policy, recent applications of the theory in the regulation of serious health hazards, is we believe, indefensible.

Our primary criticism of the technique is that it doesn't work because the methodology is both inadequate and inappropriate. But more than that we believe that it is a process used to ob-

scure rather than inform. The system deflects the discussion away from basic policy issues and translates it into an argument about numbers and equations. While it is relatively straightforward to understand that asbestos makes some people ill and kills others, it is not so simple if that argument is translated into the jargon of the economist with technical equations justifying this or that number which in turn justifies some particular action, or inaction. There is a popular expression which may say it best "Bull Shit Baffles Brains Everytime".

Nicholas Ashford, an associate professor of Technology and Policy and Assistant Director of the Centre for Policy Alternatives at the Massachusetts Institute of Technology has commented extensively on the uses and misuses of cost-benefit analysis as a tool for making policy in the area of health, safety and the environment. In a very real way he challenges the neo-conservative knee-jerk, anti-regulation attitudes popular in both the U.S. and Canada. And so they should be challenged. Those who claim that regulation costs too much or business is being destroyed by government interference are the same ones who have profited tremendously from the historical absence of regulation while destroying the health and lives of thousands of workers.

He sees a fundamental difference between economic regulations and regulation in the sphere of health, safety and the environment.

Economic regulation attempts to ensure that the price mechanism operates efficiently within the system. Economic regulation is an attempt to reduce the price of the goods and services it attempts to regulate.

Health, safety and environmental regulation, on the other hand has as its purpose the reduction of the adverse consequences of technology by reducing the social costs. Such regulation seeks to force manufacturers to internalise the costs of their technology which had previously been carried by society as a whole. This means that while the price of a particular good or service may rise, the increase is not inflationary because there is a corresponding decrease in social costs. There is a shift in who pays, from society as a whole to those who profit from the creation of the hazard or the use of the hazardous product.

He also argues that it is often assumed that, because the costs of complying with regulation can be easily converted to dollar terms that they are reliable and true costs. The vinyl chloride example is a classic case of the fallacy of that argument. In the early 1970's chemical manufacturers announced that a proposed new standard for vinyl chloride would cost two million jobs and \$65 billion. They protested that the standard was beyond their capability. Their estimates were wrong. The industry flourished, profits increased, no jobs were lost and the

real expense to industry was only five per cent of the estimate. There is an obvious problem which arises when industries estimate the cost of actions which they have little or no interest in taking. Indeed, there may even be a clear vested interest in inflating the estimate.

Ashford is also concerned about the ability to estimate the benefits of regulation. The state of the art, he argues, of estimating the number of cases of cancer or chronic diseases prevented or even injuries prevented is in its infancy. It is difficult or perhaps even impossible to accurately calculate the differences in incidence of chronic disease resulting from exposures to 1ppm or .5ppm or a particular carcinogen. (At least partly because so little of past chronic disease has been accepted as occupationally caused.) To carry the argument further, even if we could accurately estimate both the amount of disease or injury prevented by regulation and the cost of implementing such regulation, serious difficulties would still remain. The task of putting a dollar value on the health benefits or reduction in accident rates which will occur sometime in the future and over a period of time and then comparing those amounts with the current compliance cost are, at best, extremely chancy.

What for example, is the value of an arm or a leg or the loss

of activity caused by severe lung disease? What is the value of human life? The University of Rochester places it at \$350,000, The American Enterprise Institute at \$2.5 million and Cornell University at \$1.5 million: (These figures are expressed in U.S. dollars, life would be worth about 20 per cent more Canadian.) Which valuation is correct? Can one even begin to place dollar values on such items?

Then how many lives are equal to a ventilation system or a ban on a product. Would the prevention of 100 deaths be worth the banning of a \$2,500 million industry? Who can make such choices? Who plays God? Especially when decisions are to be based on such fragile technical information and what appears to us to be the total absence of a moral base.

Another problem in assigning values to life and limb is the value workers will place on their own lives. It is clear that the more one earns, the higher his or her economic standing, the higher the value which will be placed on personal life or safety. Given current economic conditions or even the hypothesis in this society that full employment means that four to six per cent of the population who want to work will not be able to find jobs, it is easy to understand how the asbestos manufacturer will, no matter how high the risks, be able to find workers ready to assume those risks. Risks which senior executives of those same corpor-

ations do not and, we suspect, would not take themselves. Are those in lowest economic categories to be assigned to a listing headed -- expendable? Add to all of these problems, inflation, and the situation becomes even more complex and difficult to rationalise. Whatever it costs to regulate asbestos will be spent over a relatively short term, whatever the benefits of that regulation are, they will occur over a relatively long term.

How does one compare a future saving to a current expense, especially when the expense and saving of any particular action or inaction falls to different segments of society.

Finally, we are not convinced that the analysis of costs and benefits of any particular regulation is enough. What are the costs and benefits of doing nothing and who pays these costs? How do they fit into the equation?

The recent case of Acrylonitrile in the United States provides us with an instructive example. The standard which was adopted for exposure by workers to this recognized carcinogen was 2ppm. This was selected over a more stringent 1ppm standard, at least in part because the estimated cost of attaining the lower standard was deemed to be too expensive. It was estimated that the 2ppm standard would cost \$1.37 million per cancer case avoided while the lower standard would have cost \$11.51 million.

The issues raised include: were the estimates in the differing rates of disease accurate; were the costs assigned to control measures accurate; how do these costs compare to the cost of cancer treatment and attendant social costs paid to widows, widowers, and dependent children; what are the values which were assigned to the loss of productivity; how much was thrown in for pain and suffering? What is the social value base which allows society's decision-makers to say that someone's life, presumably not their own, is not worth \$11.51 million?

Another important aspect of the process is to trivialise the problems, by comparing risks. The case of carcinogens is particularly appropriate to discuss. In the recent past when a chemical carcinogen was discovered, that charge alone was sufficient to alarm the public, and place the manufacturer or distributor on the defensive. The manufacturer was then compelled by public pressure to dispute the claim of carcinogenicity. Today the process is different. "Risk accounting" a part of the overall cost-benefit analysis/risk-benefit analysis approach is used to shift the debate in the industry's favour. Rather than denying it, the companies readily admit the hazards of their products. They ask that the risk of cancer be put in perspective, be compared to other risks and balanced against the benefits of the product.

This new approach is based on the recent development of public consciousness that life is full of inescapable risks. Everyday a new carcinogen is found in food, there are incredible natural disasters, someone blows up a plane that did not crash because of design faults. Even getting out of bed has its inherent hazards, one might slip and break a leg. In this way the hazards of an accident at a nuclear reactor can be compared to a flood or tornado. That which is controllable is placed beside that which is not and we are asked to compare the two. So that the introduction of fluorocarbons into the atmosphere with the eventual reduction in the ozone layer and the resultant increase in skin cancer cases ends up being compared to an individual moving to a sunnier climate. Something that no individual can prevent or control is equated with something that everyone can prevent. They are assigned the same values, and placed in the same conceptual framework. While the claim is regularly made that this kind of analysis is an attempt to place things in perspective it more regularly places the issue in a cloud. The questions are obscured and ultimately turned over to the computer to answer.

It is a myth to pretend this process of comparing costs, and benefits, assigning monetary value to risks and hazards is anything but a value laden form of manipulation tied up in a package of scientific jargon.

For working people the use of cost-benefit analysis as a basis for regulating health, safety or environmental hazards fails its own test. The costs are potentially too great and the benefits non-existent.

We therefore, recommend:

1. ~~All non essential uses of asbestos be phased out by June 1982.~~
Asbestos is a carcinogen. Since there are no safe levels of exposure to carcinogens its use should be abolished.
2. An "essential use" be defined as one for which there is no safe substitute.
3. Existence of safe substitutes should be determined by a panel of independent scientists, workers and their unions, and representatives of the general community. (Industry and government, by their past actions, lost the right to participate in such determinations.)
4. All workers in these industries must be given full and complete information regarding the risks of their exposure.
5. Exposure to asbestos where it continues in use must be limited to the lowest amount measurable.
6. A special fund should be established to defray expenses incurred by workers and communities suffering dislocation as a result of the asbestos ban. Special emphasis should be given to job retraining and job creation in the area of asbestos substitute research, development, production and use.
7. That a Crown Corporation be established to work on the removal of asbestos from all public places. We suggest a Crown Corporation because we believe a single large institution will be easier to control than thousands of "fly-by-

night" operations.

8. This same Crown Corporation should be charged with the research and development task of finding safe alternatives to the current "essential uses" of asbestos.
9. The Crown Corporation should be funded through a special tax on all asbestos mining, manufacturing and using industries.

Footnotes:

1. David Kotelchuck, "Asbestos Research" in Health/PAC Bulletin No. 61, November/December 1974. This article is an analysis of over 200 medical articles published in the U.S., Canada and Great Britain since 1974. p.21
2. J.K. Wagoner, et al, "Comments on 'Critique of Mortality Patterns Among Hard Rock Gold Miners Exposed to an Asbestiform Mineral' and 'Asbestos Fibre Exposures in a Hard Rock Gold Mine'," (Wash. NIOSH, 1976)
3. Sam Epstein, The Politics of Cancer (San Francisco, Sierra Book Club, 1978, p.3
4. Mark Green, "Faked Case Against Regulation", Washington Post Mark Green is Director of Public Citizen's Congress Watch.
5. Burke Zimmerman, "Risk-Benefit Analyses: The Cop-Out of Government Regulation", Trial Magazine, Feb., 1978, p.44
6. James Fay, A talk delivered at MIT Technology and Policy Program Symposium on LNG Policies, January 1979, cited in D.F.Noble, "Cost-Benefit Analysis", Health/PAC Bulletin, Vol. II, No. 6, July-Aug. 1980.
7. "Federal Regulation and Regulatory Reform" Report of the Subcommittee on Oversight and Investigation of the Committee on Interstate and Foreign Commerce, U.S. House of Representatives, 95th Congress, Second Session, October 1976

HEALTH AND SAFETY

Asbestos: Fact Sheet

Asbestos is a fibrous mineral. It is virtually indestructible — heatproof, fireproof and resistant to most chemicals. There are a number of different kinds of asbestos and some are considered more dangerous than others, but there is no kind of asbestos which is not dangerous.

Asbestos is a commonly used substance in industry and is found in more than 1,000 products. It may be found in such things as shingles for roofing and siding; sheets for both interior and exterior walls; pipes to carry water, gas or sewage; floor tiles; gas mask filters; processing of fruit juices, acids, beer or medicine; brake linings and clutch facings on automobiles; acoustical ceilings; plasterboard; fireproof wallboard; sheetrock tap compounds; insulation materials; gas valves and seals; welding rods and many more. Few, if any, factories or homes are without some form of asbestos.

HARMFUL EFFECTS

Asbestos is regarded as one of the most dangerous substances used in industry. It is also recognized by most experts as one of the leading industrial causes of cancer.

Asbestosis:

This is a scarring of the lungs caused by many years of breathing asbestos fibres. As the scarring develops, covering more of the lungs, they become stiff and thick making it very difficult to breathe. Early symptoms include shortness of breath and a tendency to cough easily.

Cancer:

This disease has been linked to asbestos for some years. Although all asbestos workers are at risk, those who smoke are in much greater danger. An asbestos worker who is also a smoker is 92 times more chance of dying of lung cancer than a person who neither smokes nor works with asbestos.

Mesothelioma:

This is a very rare form of cancer which attacks the membrane which lines the chest and the abdomen. It is

always fatal and occurs rarely when there has been no exposure to asbestos. Mesothelioma can occur in persons who have had only a very small exposure to asbestos. People have contracted the disease simply by washing work clothes of asbestos workers.

Gastrointestinal Cancer:

These cancers of the stomach, intestines and the rectum occur two times more often in asbestos workers than they do in the general population. Only in the past few weeks has the WCB reversed itself and allowed these cancers as compensable diseases. This change, however, has a serious qualification. A worker may receive compensation

to asbestos, is two fibres (5 microns or over in length) per cubic centimeter of air over an eight-hour day. A cubic centimeter of air is about the same volume as a thimble full of air.

Many experts believe that this is too high and have proposed a lower standard of half a fibre per cubic centimeter of air. The two-fibre limit has been in force in the United Kingdom for some years and it has not prevented asbestos-related diseases.

While this proposed standard seems to be quite low it would still allow a worker to inhale about 1.5 million asbestos fibres over an eight-hour day.

CONTROL MEASURES

The best protection against asbestos disease is to make sure that no asbestos fibres get into the air where they can be inhaled by workers. This can be achieved through engineering controls and good work practices.

Good exhaust ventilation which is properly maintained is an absolute necessity.

Wetting down asbestos before cutting, grinding or mixing will eliminate much dust.

Enclosing a dusty operation will keep the dust away from the workers.

Good housekeeping practices must be followed. Dust collection by vacuum sweepers should be done on a continuous basis.

The company should supply work clothes and take the responsibility for having them cleaned. Workers must be supplied with separate lockers for their street clothes. Showers should also be provided and they should be located between the places where work and street clothes are stored.

The company must supply adequate and comfortable respirators for all workers.

Remember, many experts are convinced that there is no such thing as a safe exposure to a substance which can cause cancer.

DID YOU KNOW THAT:

1 in 5 asbestos workers dies from lung cancer.

An asbestos worker who smokes is 92 times more likely to die of lung cancer than someone who neither smokes nor works with asbestos.

1 in 10 asbestos insulation workers dies of mesothelioma.

Asbestos workers are 2 times more likely to get stomach cancer than those who do not work with asbestos.

34% of asbestos workers will die from asbestosis or asbestos-linked cancers.

only if the disease appears twenty or more years after the initial exposure to asbestos.

Throat Cancer:

Research on asbestos-related diseases in England, the United States as well as Canada, has indicated an increased risk of throat cancer for asbestos workers. The WCB has rejected this as a compensable disease.

LEGAL LIMITS

The legal limit for exposure in Ontario,

EXECUTIVE BOARD STATEMENT

to the
LABOUR COUNCIL OF METROPOLITAN TORONTO
Thursday, April 3, 1980

The controversial issue of asbestos contamination has become a major public health hazard. The events of recent weeks (see attached press clippings) have proven that asbestos contamination is not a health hazard related only to the workplace, but one that has extremely serious implications for the public at large.

The recent disclosures that asbestos and asbestos containing materials have been identified in 150 schools across the province, clearly indicates that this problem has been neglected or at best been downplayed by a variety of government agencies at the provincial and municipal levels.

But the seriousness has been clearly identified in the Metropolitan Toronto area where a secondary school in Toronto was ordered closed for a week so that its ventilation system could be modified to ensure that no potential asbestos contamination was present as a result of installing asbestos covered air dampers.

This situation was further intensified when the Toronto Board of Education ordered an immediate investigation in 20 of its city schools to find out if there were signs of major asbestos contamination.

These incidents coupled with disclosures that other school boards were encountering similar and other asbestos related problems leads us to the conclusion that we are facing a problem of major proportions. But before we proceed any further we have to ask some fundamental questions and they are:

) Why are we only now being told that literally hundreds of buildings are in fact public health hazards?

) If the Ministry of Labour has been aware, and we are totally convinced that they were, that asbestos causes or can cause serious cancer or cancer-related illness, why is this being disclosed in such a unco-ordinated and haphazard fashion?

And why are we being told that there are some problems, but not being told of the severity and far-reaching consequences of asbestos contamination?

After posing these questions the conclusion becomes abundantly clear. The Ministry of Labour through its Occupational Health Branch has known for an extremely long period of time that asbestos contamination exists in a variety of public and private buildings and secondly there is enough medically documented evidence pertaining to the subject of asbestos air pollution to surely warrant an issuance of a government alert to all public bodies informing them that they have a major problem on their hands and to request that they immediately start on a systematic inspection of their buildings.

We have only touched in part on what we consider is a critical problem but we think that certain actions have to be taken and taken immediately and we recommend the following steps:

) That the Ministry of Labour issue a province-wide alert to every government agency, municipality, board of education, public and quasi-public body alerting them to the potential dangers of asbestos contamination;

That the Ontario government then send out a directive to the above-mentioned agencies requesting that they immediately start a systematic monitoring of all potential hazardous locations;

That the Ontario government assist these agencies in advising them on how to overcome the problem in certain hazardous situations (i.e. spraying these locations with a plastic adhesive);

That the province make available or alert public agencies of the level of exposure that are deemed to be safe;

That the province advise all public bodies on how to go about monitoring all levels of exposure and provide or advise said bodies where monitoring equipment can be acquired or purchased

to perform above-mentioned functions;

- 6) That the government immediately make available emergency funds that can be used by any public body that may have to use whatever corrective action they deem advisable;
- 7) And lastly we recommend that the government put in place a specific co-ordinating plan of action to cope with this potential health hazard crisis.

In conclusion, if trade union history and experience has taught us anything, that is, we cannot take government inaction or excuses lightly and to prove it we have a long history of work related killing diseases like mesothelioma which are related to exposure to asbestos and which were never fully explained and for years, asbestos was never considered to be a serious health hazard.

What is frightening about the present circumstances is that the same rationale is being put forward again and that is there is no great problem in our public buildings, maybe some, but nothing of great significance and a little bit of asbestos can't really hurt you.

But for the first time we can refute that argument categorically and our answer is clear and precise -- yes, exposure to asbestos can kill you and we only have to look at the medical evidence accumulated over the past 20 years to prove that people have died and will continue to die as a result of inhaling asbestos.

It is within this context that we cannot, and will not accept the feeble and unconvincing argument that we don't have an asbestos contamination problem. The problem is here, we know that it exists, and we want action and we want action now. In the event that steps are not taken to address the problem we have no recourse but to hold the Ontario government responsible for deliberate and wilful negligence.

We further recommend that this statement be sent to the 3 provincial parties and ask that they respond to previously stated concerns, and lastly, we further recommend that this Executive Board statement be circulated to every Labour Council in Ontario.

14

B R I E F

TO THE

ROYAL COMMISSION ON MATTERS OF HEALTH AND
SAFETY ARISING FROM THE USE OF ASBESTOS IN
ONTARIO

SUBMITTED ON BEHALF OF :

THE HEALTH AND SAFETY COMMITTEES OF THE
LONDON AND ST. THOMAS DISTRICT LABOUR COUNCILS

BY :

HOWARD HUNTER, VICE-PRESIDENT
ST. THOMAS & DISTRICT LABOUR COUNCIL

St. Thomas, Ontario
14 January 1980

Mr. Chairman:

The London and St. Thomas District Labour Councils are pleased to submit this brief for your consideration on behalf of the over 28,000 trade union members in the cities of London and St. Thomas and surrounding areas.

This brief is intended to outline some areas we feel should be included in regulations regarding the use of asbestos, as well as some areas we feel can be enlarged upon.

HEALTH EFFECTS OF ASBESTOS

In the early 1900's asbestos was recognized as a cause of lung scarring, in the 30's as a cause of lung cancer, since 1950 as a cause of mesothelioma, and since 1970 as a cause of laryngeal and stomach cancer. The Canadian Insurance Companies recognized the dangers posed by asbestos when in 1918 they stopped selling life insurance policies to asbestos workers.

During the 1960's Dr. Irving Selikoff at New York's Mt. Sinai Medical Centre published the results of his extensive studies which proved conclusively the deadly nature of asbestos. Yet the asbestos industry continues to grow, proliferating the use of a substance which has and will cause thousands of deaths. There have been reports of mesothelioma developing in workers after less than one month of work exposure to asbestos. Children of asbestos workers have developed the disease years later as a result of their exposure to asbestos on their father's clothes, and even residents in the vicinity of asbestos plants have developed this cancer - i.e. in 1975 the CBC did a documentary revealing the results of exposure to the community at the Thedford Asbestos Mines in Quebec, where concentrations of 50-60 fibres/cc were found.

THE EXPOSURE OF ASBESTOS WORKERS

As has been stated many times, asbestos is perhaps the best known human carcinogen. Medical science has been unable to determine a safe

level for exposure to asbestos, therefore the hygiene level must be zero.

In the last year both NIOSH in the U.S. and the British Advisory Committee on asbestos concluded that there is no safe exposure level to asbestos, and recommended that every effort be made to reduce the exposures to a level as small "as is reasonably practicable" or the "lowest feasible level". They also emphasized the substitution of safe alternatives.

We therefore recommend that the allowable asbestos exposure level be lowered to "the lowest detectable level" and that level be applied for all types of asbestos. We further recommend that a policy of gradual compulsory substitution of safe, tested alternatives with a total removal date of 1990. It is also recommended "that lowest detectable level" take into consideration evidence from NIOSH that contrast microscopy can measure levels as low as 0.001 F/cc. The standards of exposure should apply to every building in the province of Ontario. Only when there is no measurable level of asbestos in a building can we be reasonably sure that people are not "inhaling, ingesting, or absorbing asbestos". We are opposed to the use of "time-weighted average exposure limits" over a forty hour work week. The TLV/TWA system of measurement does not protect persons exposed to a substance. There is no scientific evidence to support the assumption that constant low level exposure is the same as intermittent high level exposure. TWA measurement is based on the taking of so called representative "grap samples". We feel that only constant monitoring over a total exposure time can result in an accurate assessment of exposure, and standards should be set instead, as "hygiene limits", following ILO terminology, and treated as maximum allowable concentrations, not average exposures.

We would like to refer you to a speech delivered to the Canadian Manufacturers Association on May 12, 1977 by then Minister of Labour, Dr. Bette Stephenson, in which she suggests a more progressive idea for standards than the traditional TLV/TWA concept.

"Ontario's exposure standards and guidelines must differ from existing standards, which they should replace. They should not be based, as existing threshold limit values are based, on exposures during a 40-hour week....

The new standards and guidelines should be based on the cumulative exposure to chemical agents and physical substances over time." (pg. 4)

In those places where the elimination of asbestos has not or will not take place, we feel that a system of standardized warning signs should be mandatory. They should be posted in the area indicating the type of hazard present. We are aware that a general labelling policy is being discussed by the government. However, warning signs are essential to notify anyone entering a hazardous area. Labels should also be present on all containers in which asbestos or products with asbestos in free form are stored or transported. Also workers who must enter an area where there is a measurable asbestos level should be fully informed of the health hazards involved in exposure with adequate protection to reduce or eliminate the exposure.

Removal of asbestos is the only permanent solution. We understand that this is a time consuming, complicated and expensive procedure. Possible ~~encapsulation~~ which is faster, cheaper and will control exposure could be an answer in some cases, but care must be taken to insure that it is only used in areas where contact damage will not occur and that an on-going inspection program to check for damaged areas. Also enclosure which is cheaper, faster and simpler could be used in some cases, but it does not eliminate asbestos build-up behind the enclosure and must be used with an inspection program.

CONCLUSION

In summation, Mr. Chairman, we feel the best protection against the dangers of asbestos is to remove it from use. Asbestos can be removed and replaced by other material - materials tested safe to use. Where it must be used, better engineering controls are essential to eliminate all traces

of asbestos fibres from the air.

All asbestos types are carcinogens and therefore must be controlled to levels that are "the least detectable" and every attempt to substitute safe, tested alternatives be made.

The Council would like to thank the Commission for this opportunity and we wish you well in your deliberations.

Presented on Behalf of:

THE ST. THOMAS AND DISTRICT LABOUR COUNCIL

Verne Warren, President
Howard Hunter, Vice-President

Presented on Behalf of:

THE LONDON AND DISTRICT LABOUR COUNCIL

R. E. Ingles, President
W. T. Halliday, Vice-President

15
Brougham, Ontario
LOH 1A0

January 14, 1981

Dear Linda:

I have no idea if this is the type of material the Commission is hoping to receive.

The red binder contains material that is mainly to do with W.C.B.

The envelope inside the binder gives some idea of the ways I tried to get the Federal Government to stand by the statements officials made re the banning of "blue" asbestos and how they waffled until they finally say (or this is how I read it) that asbestos does more good than harm - which may well be true if you haven't lost someone because of it.

If this material should all be presented to a particular phase of the hearings, would you be good enough to insert the asbestos ("blue") sheets in the binder. I could supply another copy of all of this material. Please let me know.

Yours truly,

Frances Day

THIS SUBMISSION TO THE ROYAL COMMISSION ON ASBESTOS, IS COMPRISED OF LETTERS WRITTEN AND REPLIES RECEIVED BEFORE AND AFTER THE DEATH OF MY HUSBAND IN DECEMBER 1974, REGARDING THE DIFFICULTIES EXPERIENCED WITH THE WORKMEN'S COMPENSATION BOARD AND THE FEDERAL GOVERNMENT REGARDING THE USE, MISUSE OR MISHANDLING OF ASBESTOS IN CANADA AND PARTICULARLY THE CANADIAN JOHNS-MANVILLE COMPANY OF CANADA AT PORT UNION, ONTARIO. THE INFORMATION HEREIN WAS GATHERED OVER A RATHER LENGTHY PERIOD AND WHILE ADMITTEDLY SOME WAS DONE AT A TIME PERIOD IN MY LIFE THAT WAS RATHER UPSETTING, I BELIEVE THAT MOST IS STILL RELEVANT TODAY. THE MATERIAL ATTACHED IS COPIES OF COPIES FOR THE MOST PART, BUT I BELIEVE THE INFORMATION IS STILL READABLE AND I WILL BE GLAD TO CLARIFY ANY PART THAT YOU, THE READER, FIND DIFFICULT TO UNDERSTAND BECAUSE OF POOR COPY.

YOUR ENQUIRY HAS BEEN A LONG TIME COMING FOR SOME OF US BUT WELCOME NONETHELESS. CIRCUMSTANCES HAVE NOT CHANGED APPRECIABLY AND WHAT I TRIED TO DO IN PREVIOUS YEARS IS STILL APPLICABLE TODAY. WHILE YOU MAY FIND SOME PARTS TO BE UNINFORMATIVE FROM THE COMMISSION'S STAND POINT THE ARTICLES ARE TIED TOGETHER WITH ONE SALIENT POINT IN MIND, TO CORRECT THE AWFUL INJUSTICES FROM THE WORKER'S VIEWPOINT AND TO BRING INTO FOCUS THE HARDSHIPS AND THE UNBELIEVABLE REDTAPE THAT SOME PEOPLE MUST GO THROUGH TO OBTAIN WHAT SHOULD BE RIGHTFULLY THEIRS.

MAY I EXPRESS SINCERE THANKS TO THE COMMISSION MEMBERS AND WISH THEM GOOD LUCK IN THEIR MONUMENTAL TASK OF SIFTING THROUGH ALL OF THE MANY VARIED RESPONSES SUCH AS MINE, AS WELL AS THE TECHNICAL DATA THAT MUST BE OBSERVED.

FRANCES DAY

BROUGHAM, ONTARIO

LOH 1A0

TELEPHONE: 683-4646

THE WORKMEN'S COMPENSATION BOARD

90 HARBOUR STREET, TORONTO 117, ONTARIO TELEPHONE 362-3411 AREA CODE 416



June 20, 1973

Mr. Gordon Day
BROUGHAM
Ontario

Dear Mr. Day:

Claim - S9410369

We have received the Advisory Committee's report of examination and they have diagnosed the presence of an industrial chest condition, 50%.

We have decided to pay full compensation in relation to the lay off commencing April 4, 1973 due to the chest investigation. Effective the date of the Committee's examination, May 23, 1973 full compensation must be ceased and payment made at your disability rating of 50%. We will continue to pay you at that rate for so long as you remain disabled from work.

Please arrange to have the enclosed progress reports completed and returned to us.

Yours very truly,

CLAIMS DEPARTMENT

A handwritten signature in cursive script, reading "J. C. Hutchinson".

J. C. Hutchinson
Assistant Claims Supervisor
Encl.
fc

cc - Employer

WHEN WRITING THE BOARD PLEASE QUOTE ABOVE FILE NUMBER

10 HARBOUR STREET, TORONTO 117. TELEPHONE 362-3411 • AREA CODE 416

WORKMAN'S REPORT OCCUPATIONAL CHEST DISEASE

MESSAGE TO WORKMAN

THERE IS A DOCTOR'S REPORT FORM
TACHED. PLEASE TAKE IT TO YOUR DOCTOR
FOR COMPLETION.

RAY GORDON
BROUGSAP ONT

S 3420365

LAST NAME																			
A	Y																		
FIRST NAME(S)																			
S	O	R	D	O	N														
POSTAL ADDRESS																			
S	R	O	U	G	H	A	N												
CITY OR TOWN																			
V	N	T	A	R	I	O													
SOCIAL INSURANCE NO.										PHONE NO.									
1	7	-	9	6	1	-	3	2	.	9	4	2		4	6	4	0		

ACC DENI DATE
06APR73

CON JOHNS MANVILLE
WEST HILL P O N.Y.

50	WEIGHT 151	HEIGHT 5 FT. INS.	SEX M	MARRIED M
----	---------------	-------------------------	----------	--------------

16 NAME AND ADDRESS OF EMPLOYER WHERE YOU CLAIM YOU WERE LAST
POSED TO DUST.

Canadian Johns-Manville Co. Ltd.
West Hill P.O., Ontario

NESS

Asbestos Products Cement and Insulation

THE FULL PARTICULARS OF YOUR EXPOSURE TO DUST SHOWING NAMES OF EMPLOYERS WITH DATES
PERIOD OF EMPLOYMENT WITH EACH EMPLOYER.

[illegible]

OF BIRTH

June 2/22

MINERS CERTIFICATE NO.

ARE ALL THE ABOVE IS TRUE AND CORRECT AND I CLAIM COMPENSATION AND/OR MEDICAL AID.

THIS 3. DAY OF May

19 73

CLAIMANT SIGN HERE

Garden Way

6S

REV 3.7

MLF 483 .

June 22nd, 1973

Mr. J. C. Hutchinson,
Assistant Claims Supervisor,
The Workmen's Compensation Board,
90 Harbour Street,
Toronto 117, Ontario.

Dear Mr. Hutchinson:-

Re:- Claim S9410369 - Gordon Day.

Thank you for your letter of June 20th, 1973.

I would ask you to reconsider your decision to pay full compensation to Mr. Day from April 4, 1973 until May 23, 1973 when he was seen by your committee. As you can appreciate, although the committee saw Mr. Day at this time the results of the committee did not come through until June 20th, 1973. Consequently, I feel that Mr. Day should be awarded 100 per cent compensation until the committee makes their determination.

I was speaking to Mr. Day this morning and he advised me he saw his doctor - Doctor Smith last night at the Oshawa Clinic. Dr. Smith had indicated that Mr. Day had not fully recovered from his operation and that he would be examining Mr. Day further and referring him to other specialists. I understand that the earliest Dr. Smith would like Mr. Day to return to work would be early August.

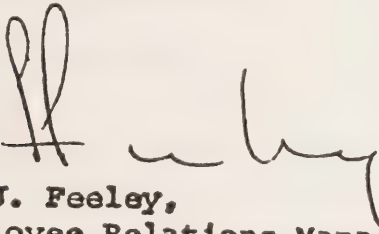
June 22nd, 1973

I realize that you must get documentation of this from Dr. Smith. In view of this could we not anticipate that Mr. Day would receive full compensation until his doctor and/or specialists have advised that he is able to return to work or seek other employment.

Would you kindly look into these matters and advise me of your findings.

Thank you.

Yours very truly,



F. J. Feeley,
Employee Relations Manager.

cc: Mr. Gordon Day.



Gord. If W.C.B do not send
you a copy of their reply
to me. I'll give you a shout
& let you know the story

Frank.

Please return this form

THE WORKMEN'S COMPENSATION BOARD

90 HARBOUR STREET, TORONTO 117, ONTARIO TELEPHONE 362-3411 AREA CODE 416



July 9, 1973

Mr. Gordon Day
Brougham
Ontario

Dear Mr. Day:

Claim - S9410369

The matter of payment of full compensation after May 23, 1973 has been given very serious thought and discussion.

It is the agreed opinion that the reduction of full compensation to temporary partial compensation 50% effective May 23, 1973 was quite justified and quite in keeping with the results of the examination carried out on May 23, 1973. There is no indication on file that there was any continuing complications of the lung biopsy, and therefore it is felt that the present method of payment is in order.

Yours very truly,

CLAIMS DEPARTMENT

A handwritten signature in cursive script, reading 'J. C. Hutchinson'.

J. C. Hutchinson
Assistant Claims Supervisor
mm
c.c. Employer



ONTARIO

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

WILLIAM NEWMAN, M.P.P.
PARLIAMENTARY ASSISTANT
TO THE MINISTER

July 27, 1973.

Mr. Gordon Day,
Brougham,
Ontario.

Dear Mr. Day:

Thank you for your letter and enclosures
regarding the Workmen's Compensation Board.

I will take this up with the Board right away
to see what can be done to help you and as soon as I get
any information I will be in touch with you.

Kind personal regards.

Yours sincerely,

William Newman, M.P.P.,
Ontario South.

WN:AC

P. S. I am returning your file.

Please let me know how you make out with your
unemployment insurance in order that I may follow
it up.

July 31, 1973

Mr. J. C. Hutchinson,
Assistant Claims Supervisor,
The Workmen's Compensation Board,
90 Harbour Street,
Toronto 117, Ontario.

Dear Mr. Hutchinson:-

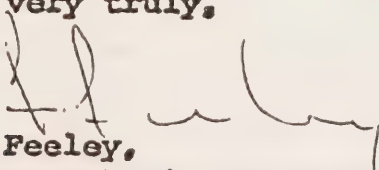
Re:- Claim S9410369 - Gordon Day.

Re your letter of June 28th. Do you now have sufficient information at hand to answer my letter of June 22nd?

Mr. Day has advised me that his doctor still does not feel that he is fully recovered to return to work and may have to return to the hospital for further examination.

Would you look into the matter for me and advise at your earliest convenience.

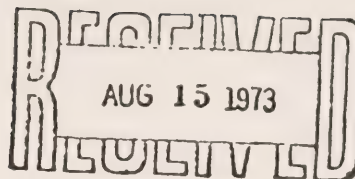
Yours very truly,


F. J. Feeley,
Employee Relations Manager.

FJF/ag

P.S. I have just received a 'phone call this moment and Mr. Day has advised me he has received payment from May 23rd to August 1st inclusive for \$518.00. Would you advise me how this was calculated.

cc: G; Day



ce of the
ster

Ministry of
Labour

400 University Avenue
Toronto Ontario

August 14th, 1973.

Mr. William Newman, M. P. P.,
Member for Ontario South,
Parliamentary Assistant,
Ministry of Transportation and
Communications,
Ferguson Block,
Queen's Park,
Toronto, Ontario.

Dear Bill:

Following my letter to you of August 3rd, 1973, I have been in contact with senior officials at The Workmen's Compensation Board concerning Mr. Gordon Day's claim C9410369.

I have been informed that Mr. Day developed chest symptoms which were felt to be related to exposure to asbestos and he was admitted to hospital on April 4th, 1973 for a lung biopsy to assist in positive diagnosis.

On May 23rd, 1973, Mr. Day was carefully examined by the Advisory Committee on Occupational Chest Diseases at which time the complete findings were reviewed with a diagnosis of asbestosis. It was the medical opinion that Mr. Day should be provided with benefits at 50 per cent and that he was capable of returning to suitably modified employment. Full benefits were paid to May 23rd, 1973 to allow a reasonable convalescence period related to the lung biopsy. Mr. Day, in accordance with the medical recommendations of the Advisory Committee, has been provided with benefits at the 50 per cent rate from May 23rd, 1973.

I have been further advised that the Board's senior chest consultant has again completely reviewed the findings on hand with the opinion that the medical information on file does not support an increase in the benefits rate. While it has been indicated by the attending doctor that further medical enquiry may be necessary, this particular aspect of Mr. Day's problem does not appear to relate to his compensable condition.

- continued -

Page Two

The Board has indicated that while it is the opinion of their consultants that Mr. Day is currently receiving his correct entitlement, they will be pleased to carefully review any further medical submissions. Mr. Day, of course, also has the right of appeal concerning his benefits rate which would be to the first level in that procedure, the Review Committee.

I trust this information will be of assistance to you in Mr. Day's case.

Yours very truly,

A handwritten signature in cursive script, appearing to read 'Fern'.

Fern Guindon,
Minister of Labour.



MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

WILLIAM NEWMAN, M.P.P.
PARLIAMENTARY ASSISTANT
TO THE MINISTER

August 15, 1973

Mr. Gordon Day
Brougham
Ontario

Dear Mr. Day:

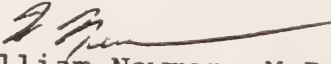
Further to my letter to you of July 27, 1973, I am enclosing a copy of a letter I received this date from the Minister which is self-explanatory.

I would suggest that you get a Doctor's Certificate pointing out that you are really unable to go back to work. I will be glad to pursue this further when I receive this.

I assume that you received your additional payments to this point in time. If you have not, please let me know. If you care to appeal your benefit rate I would be only too glad to do this for you, if you would be kind enough to drop me a note authorizing me to do so.

Kind personal regards.

Yours sincerely,


William Newman, M.P.P.
Ontario South

WN:dp
Encl.



ONTARIO

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

WILLIAM NEWMAN, M.P.P.
PARLIAMENTARY ASSISTANT
TO THE MINISTER

September 6, 1973

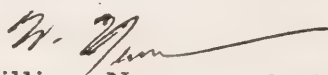
Mr. Gordon Day,
Brougham,
Ontario.

Dear Mr. Day:

Thank you very much for your letter outlining your further problems, I will again contact the unemployment insurance people and if nothing is done in the next ten days please give me a shout. I will also pursue your workmen's compensation claim and file an appeal. As soon as I have further information I will be back to you.

Kind personal regards.

Yours sincerely,


William Newman, M.P.P.,
Ontario South.

WN:SK

P.S. I find I do not have a record of your Social Insurance number and I need this before I 'phone the UIC. Could you 'phone my office and let me have this number?

W.N.

THE WORKMEN'S COMPENSATION BOARD

90 HARBOUR STREET, TORONTO 117, ONTARIO TELEPHONE 382-3411 AREA CODE 416



September 6, 1973

Mr. Gordon Day
BROUGHAM
Ontario

Dear Mr. Day:

Claim - S9410369

We received an appeal concerning the payment of temporary partial compensation 50% during the period May 23, 1973 to June 20, 1973. We have decided that it would be reasonable to pay full compensation to the date of the notification of your clinical disability by the Advisory Committee, namely June 20, 1973.

Please realize that this does not mean that we acknowledge any change in the actual status, and we still do not feel that there were any complications of the lung biopsy.

Yours very truly,

CLAIMS DEPARTMENT

A handwritten signature in cursive script, reading "J. C. Hutchinson".

J. C. Hutchinson
Assistant Claims Supervisor
fc

cc - Mr. F. J. Feeley



HONOURABLE MICHAEL STARR
ACTING CHAIRMAN

THE WORKMEN'S COMPENSATION BOARD
ONTARIO

90 Harbour Street,
Toronto, Ontario.
M5J 1C1
19 September 1973

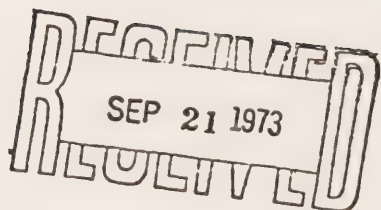
Mr. William Newman, M. P. P.,
Parliamentary Assistant to the Minister,
Ministry of Transportation and Communications,
Ferguson Block,
Queen's Park,
Toronto, Ontario.

Bill
Dear Mr. Newman,

I have received your letter of September 7th,
together with copies of correspondence relating to Mr.
Gordon Day of Brougham, Ontario. As soon as I have
had an opportunity to review this claim I will
communicate with you again.

Yours sincerely,

Michael





ONTARIO

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

WILLIAM NEWMAN, M.P.P.
PARLIAMENTARY ASSISTANT
TO THE MINISTER

September 26, 1973.

Mr. Gordon Day,
Brougham, Ontario.

Dear Mr. Day:

Further to my letter of September 6th, I am enclosing copy of a letter I received from Mr. Michael Starr the Chairman of the Workmen's Compensation Board. As soon as I have further information, I will be back to you.

Thank you for your letter of September 22nd and I shall hold this matter in abeyance until I hear from you again as you suggest.

Kind personal regards.

Sincerely yours,

A handwritten signature in cursive script, appearing to read 'W Newman'.

William Newman, M.P.P.,
Ontario South.

WM: bc
Encl.



ONTARIO

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

WILLIAM NEWMAN, M.P.P.

PARLIAMENTARY ASSISTANT

TO THE MINISTER

October 9, 1973.

Mr. Gordon Day,
Brougham,
Ontario.

Dear Mr. Day:

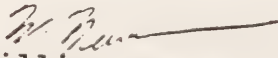
Further to my letter of September 26th, I have now been advised that your case has been reviewed by the WCB and your claim has been referred to the Review Committee, the first level of appeal under the present system concerning the reduction of benefits to 50% from June 20th, 1973.

While I realize that you would not be present at this appeal, should you be dissatisfied with the decision, you have the right to personally appear with or without representation at the next level, the Appeal Tribunal.

I trust this is satisfactory and I will keep you informed.

Kind personal regards.

Yours sincerely,


William Newman, M.P.P.,
Ontario South.

WN:AC



ONTARIO

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

WILLIAM NEWMAN, M.P.P.
PARLIAMENTARY ASSISTANT
TO THE MINISTER

October 31, 1973

Mr. Gordon Day,
Brougham,
Ontario.

Dear Mr. Day:


I have a further letter from Mr. Hutchinson, Assistant Claims Supervisor of The Workmen's Compensation Board, and a Consultant from The Board has discussed your case with your family physician Dr. Smith of the Oshawa Clinic.

You were recently admitted to the Hospital for treatment of a non-compensable kidney condition and the evidence indicates there was certainly no connection between this problem and your industrial chest disability.

Your chest problem was discussed and it was the personal opinion of your doctor the two were not related, however I referred your case to the Review Committee for their consideration to see if they can do anything to help you. As soon as I hear back from them, I will be in touch with you.

Kind personal regards,

Yours sincerely,


William Newman, M.P.P.
Ontario South.

WN:dh



ONTARIO

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

WILLIAM NEWMAN, M.P.P.
PARLIAMENTARY ASSISTANT
TO THE MINISTER

November 6, 1973.

Mr. Gordon Day,
Brougham,
Ontario.

Dear Mr. Day:

I received a copy of the Review Committee Report which denies you full benefits in the Workmen's Compensation Board. As you know, Review Committee decisions may be appealed before the Appeal Tribunal, and if you can gather the necessary medical evidence from your doctor, I would suggest that you do appeal this matter and appear in person and explain your case to the Appeal Tribunal. If I can be of any assistance in this matter, please do not hesitate to contact me.

Kind personal regards,

Yours sincerely,

A handwritten signature in dark ink, appearing to be 'W. Newman', followed by a horizontal line.

William Newman, M. P. P.,
Ontario South.

WN:at

THE WORKMEN'S COMPENSATION BOARD

90 HARBOUR STREET, TORONTO 117, ONTARIO TELEPHONE 382-3411 AREA CODE 416



November 7th, 1973

Mr. Gordon Day,

BROUGHAM, Ontario.

Dear Mr. Day:

Claim S9410369

With reference to your recent request, we are sending you
a copy of our letter dated October 31st, 1973.

Yours very truly,

CLAIMS DEPARTMENT,

A handwritten signature in cursive script that reads "J.C. Hutchinson".

J. C. Hutchinson,
Asst. Claims Supervisor.
mf

October 31st, 1973

Mr. Gordon Day,
Brougham,
Ontario.

Dear Mr. Day:

Claims C 9410369.

On September 7th, 1973, Mr. W. Newman, M.P.P. wrote this office on your behalf appealing the benefits being awarded to you on a temporary partial 50 per cent basis, and following an additional assessment by the Claims Department, your file was referred to the Review Committee, the first step in the appeal system.

It is recognised that you have a industrial chest condition which has been assessed by the Advisory Committee on occupational chest disease of the Ministry of Health awarding you the disability payments of 50 per cent. This means that as a result of your occupational chest disease, that you are not totally disabled from participating in the open labour market.

Additional medical information has indicated that it was necessary for you to be admitted to hospital for a unrelated kidney condition and it is quite possible that both your conditions are at this time disabling you from employment. There is however no relationship between the kidney problem which necessitated treatment and your industrial chest condition.

The Review Committee in studying these reports denies the appeal as it would appear from the information contained in the file that the payment you are presently receiving recognizes the degree of compensable disablement.

Review Committee decisions may be appealed at a personal hearing before the Appeal Tribunal, as outlined in the attached brochure under "Appeals."

Page 2

Claims: C 9410369, Gordon Day

A copy of this letter will be forwarded to Mr. William Newman, M.P.P. and to the Canadian Johns Manville Company Limited, your employer.

Yours very truly,

Chief,
Review Committee.
R.S. Bourne/dt
R.E. Atkins.
Encl. IAD



ONTARIO

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

WILLIAM NEWMAN, M.P.P.
PARLIAMENTARY ASSISTANT
TO THE MINISTER

December 18, 1973

Mr. Gordon Day
Brougham
Ontario

Dear Mr. Day:

Further to your meeting with me the other day, I have written to the Honourable Michael Starr regarding your \$65.00 a week permanent disability. I have also written to Mike Starr appealing your decision to the Appeal Tribunal.

I have also sent you an L.G.O.B. application and have written the Minister of Government Services regarding the type of work that might be available.

As soon as I have answers back, I will be back to you.

Kind personal regards,

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'W. Newman'.

William Newman, M.P.P.
Ontario South

MICHAEL STARR
CHAIRMAN



THE WORKMEN'S COMPENSATION BOARD
ONTARIO

90 Harbour Street,
Toronto, Ontario.
M5J 1C1
January 4th, 1974.

Mr. William Newman, M.P.P.,
Member for Ontario South,
Ministry of Transportation and Communications,
Ferguson Block,
Queen's Park,
Toronto, Ontario.

Bill
Dear Mr. Newman:

Claim: C9410369 - Gordon Day

I am pleased to be now able to advise you further concerning your enquiry on behalf of Mr. Gordon Day.

Mr. Day is presently in receipt of benefits at 50 per cent based on the recommendation of the Advisory Committee on Occupational Chest Diseases as representing the degree of compensable disability present at the time of his examination in May 1973.

While Mr. Day's benefits are being paid on a temporary basis, they are in lieu of a pension and should he take suitable employment outside of the exposure industry his benefits would continue at the current rate. Also in view of a recent amendment to the Act effective January 1st, 1974, Mr. Day's present benefits can now be continued in the event that he returns to work with the Canadian Johns-Manville Company Limited. Prior to this amendment, compensation could only have been provided on a difference in earnings basis.

It should be emphasized, however, that it is the opinion of the Advisory Committee that Mr. Day should not return to employment where he would have further exposure to silica or asbestos. I understand it

- continued -

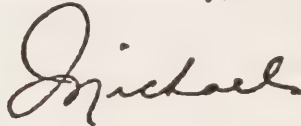
is the intention of the Advisory Committee to again assess Mr. Day's chest condition, at about this time, following which recommendations will be made as to the ongoing degree of disability based on the findings at this review.

While the amendment to the Workmen's Compensation Act effective July 1st, 1973 increased the maximum earnings on which benefits are based to three quarters of \$192.31 or \$144.23 per week, this applies only to accidents or disability occurring on or after that date. Regrettably an adjustment in this regard cannot be provided under the circumstances.

As requested, a hearing will now be arranged with the Appeal Tribunal concerning the rate of benefits which as you are aware were confirmed at the 50 per cent level by the Review Committee. Mr. Day will be advised as to the date set shortly.

I trust this information will be helpful to you in Mr. Day's case.

Yours sincerely,

A handwritten signature in cursive script, appearing to read "Michael".

MS/bd



ONTARIO

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

WILLIAM NEWMAN, M.P.P.

PARLIAMENTARY ASSISTANT

TO THE MINISTER

January 8, 1974

Mr. Gordon Day
Brougham
Ontario

Dear Mr. Day:

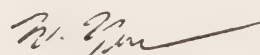
Further to my correspondence to you regarding compensation, I am enclosing a copy of a letter received from Mr. Michael Starr, Chairman of the Workmen's Compensation Board, which is self-explanatory. I trust this will clear up some of your concerns.

You were talking about other employment and I would suggest to you that you might contact some of the agencies which do security work around various buildings, perhaps in the Sheridan Mall, which might be easier for you.

I am also enclosing a copy of the list of people who do the cleaning contracts for the Government of Ontario and if you wish to contact any of these people, I am sure they might be able to find some sort of work for you in this particular field.

Kind personal regards,

Yours sincerely,


William Newman, M. P. P.
Ontario South

CLEANING CONTRACTS

AA-ONE MAINTENANCE COMPANY
170 Main Street
Toronto, Ontario

General Manager - Mr. C. Vogiatzis
694-8384

- 360 Christie Street
- 434 & 454 University Avenue
- West Bldg., Garages #6 & 42
and New Equipment Building
at M.T.C. Complex, Downsview

ALLIED BUILDING SERVICES OF ONTARIO LTD.
135 Midwest Road
Scarborough, Ontario

Services Manager - Mr. D. Eckersley
751-3462

- 135 St. Clair Avenue West
- Ontario Ministries of Health
and Environment at Resources
Road and Highway 401

CONCORDE MAINTENANCE LIMITED
145 King Street West
Toronto, Ontario

Manager - Mr. Powers
364-6400

- South Frost Building

CONSOLIDATED BUILDING MAINTENANCE COMPANY
111 Peter Street
Suite 618
Toronto, Ontario

- 130 Queen Street West
(Osgoode Hall)

Vice President - Mr. R.R. Quinn
364-7257

EXECUTIVE OFFICE CLEANING & MAINTENANCE
608 Woodbine Avenue
Toronto, Ontario

- North Frost Building

Mr. P. PaSidis
690-2860

FOX MAINTENANCE SERVICES
1700 Victoria Park,
Suite 203
Scarborough, Ontario

- 311 Jarvis Street
Juvenile & Family
Detention Court

Manager - Mr. P. Mark
752-1756

MacM JANITORIAL SERVICES
Royal Coliseum Building
Exhibition Park
Toronto, Ontario

- Ontario Stock Yards Board
Administration Building
590 Keele Street

President - Mr. J. McMurtrie
537-7301

MAINTENANCE SYSTEMS DIV. OF HYGIENE PRODUCTS
128 Galaxy Blvd.
Rexdale, Ontario

Mr. B. Robbins
678-1947

MODERN BUILDING CLEANING
1694 Midland Avenue
Scarborough, Ontario

Mr. J.M. Horgan
757-6217

NEW LIFE BUILDING MAINTENANCE OF CANADA
349 Palmerston Blvd.
Toronto, Ontario

OLYMPIA CLEANERS & MAINTENANCE COMPANY
17½ Christie Street
Toronto, Ontario

Manager - Mr. C. Buda
534-4412.

- 880 Bay Street
- 360 Christie Street
(Ministry of Health)

- Queen's Park Office
Extension

- 2520 Dixie Road
(M.T.C. Driver Examination
Centre)

- 171/185 Judson Street
(M.G.S. Regional Office Comple.
- O.P.P. No. 5 Downsview
- 262 Falstaff Avenue
(Provincial Court)
- 3215 Erindale Station Road
(Records Centre)
- 70 Lombard Street

THE WORKMEN'S COMPENSATION BOARD

90 HARBOUR STREET, TORONTO 117, ONTARIO TELEPHONE 362-3411 AREA CODE 416



• January 9, 1974

Mr. Gordon Day,
BROUGHAM, Ontario.

Dear Mr. Day:

CLAIM 9410369

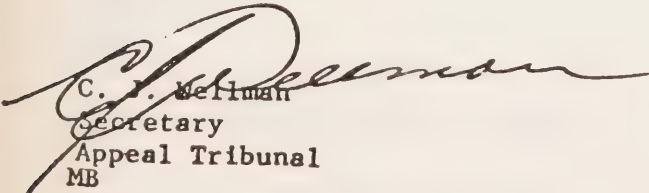
On receipt of your appeal from the decision of the Review Committee, the Appeal Tribunal has scheduled a hearing for you Thursday, February 7, 1974 at 2 p.m. at the Board's offices, 90 Harbour St., 4th floor, Toronto.

You have the right to be represented at this hearing, and are entitled to bring any witnesses you may desire. The Appeal Tribunal reserves the right to examine any witnesses presented.

Claimants requesting hearing before the Appeal Tribunal are responsible for any expense incurred in attending hearings.

You must let us know as soon as possible after receipt of this letter that you can attend this hearing. To assist you, we are enclosing a form and an envelope for your reply.

Yours very truly,


C. J. Newman
Secretary
Appeal Tribunal
MB

encls.
cc Mr. William Newman, M.P.P.

THE WORKMEN'S COMPENSATION BOARD

90 HARBOUR STREET, TORONTO 117, ONTARIO TELEPHONE 362-3411 AREA CODE 416



June 3rd, 1974

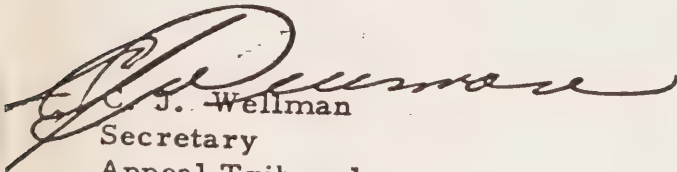
Mr. Gordon Day
Brougham, Ontario

Dear Mr. Day:

Claim 9410369

Following your appearance before the Appeal Tribunal, all the evidence presented at the hearing has been carefully reviewed and I have been instructed to supply you with a copy of the Appeal Tribunal's findings, which is attached.

Yours very truly,


C. J. Wellman
Secretary
Appeal Tribunal
/jcb
att.

cc: Canadian Johns Manville

The Hon. Wm. Newman

Claim: 9410369 - Gordon Day

The Appeal Tribunal has heard the evidence presented at the hearing on February 7th, 1974 at Toronto and has studied the file and finds:

That Mr. Day is requesting total compensation benefit after June 20th, 1973 instead of the partial compensation paid to him.

He states that he commenced to have gall bladder and other trouble in June 1973, however, he feels that this is a complication of his chest disability.

He returned to work on January 14th, 1974 at Johns Manville. It is work in dust to which he should not be exposed, however, he must return to some type of work. Before taking this job he tried to get a job at five other factories in the area but without success.

That subsequent to the hearing Mr. Day developed further complications on March 20, 1974, which were considered as being related to his compensable disability.

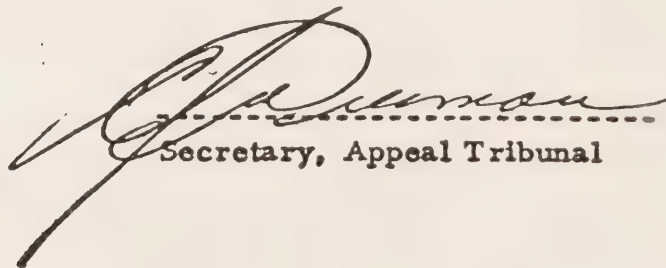
That after hearing the claimant and reviewing the file, the Tribunal finds that Mr. Day is entitled to full benefits after June 10th, 1973.

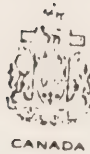
The Appeal is allowed.

Members

W. F. Jacobs, M.D.
E. C. Kergon
J. A. Cameron, Q.C.

June 3rd, 1974
*jcb


Secretary, Appeal Tribunal



MINISTER OF NATIONAL HEALTH AND WELFARE

MINISTRE DE LA
SANTÉ NATIONALE ET DU BIEN-ÊTRE SOCIAL

Jul 3 1974

Mrs. G. Day,
Brougham, Ontario,
LOH 1A0

Dear Mrs. Day:

Thank you for your letter telling me of your concern about income security for disabled workmen. I was extremely sorry to hear about your husband's condition, and hope that he has been able to make suitable arrangements to augment his 50 per cent disability pension from Workmen's Compensation.

You have mentioned the need for re-education and retraining in such cases. If your husband wishes to get retraining I recommend that you see your nearest federal Manpower office to check the available alternatives. A counsellor will present your husband with a list of choices for job retraining that he may want to pursue.

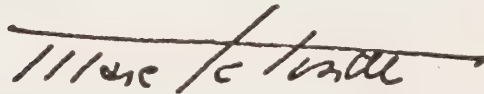
If accepted, your husband should receive a training allowance during the course of his retraining. Most important, your husband will be trained to do a job in which he will not be inhibited by his present illness.

Thank you for the suggestions you have made for improving our existing income security system. Last year, the federal and provincial Ministers responsible for social security launched a joint review of the overall system, with a view to major reform within that system. At that time I presented a Working Paper on Social Security as a basis of discussion, a copy of which I enclose. In it, you might wish to particularly note our propositions relative to an employment strategy, and to the concept of guaranteed income for those who are no longer able to work.

In our review we are also looking closely at the question of early retirement, and the factors, such as industrial disability, that might warrant it. We are examining, too, the question of a partial disability pension under the Canada Pension Plan; as you know, at present disability pensions are only available to C.P.P. contributors who are unable to hold down substantially gainful employment because of their disability. In many countries partial pensions are provided in cases of partial disability. Another approach would be an income supplement for people who can only work part time.

I appreciate the suggestions you have made, and can assure you that they will be taken into account during the course of our social security review.

Yours truly,

A handwritten signature in dark ink, appearing to read "Marc Lalonde", with a long horizontal stroke extending to the right.

Marc Lalonde.



Office of the
Minister

Ministry of the
Environment

416/965-1611

135 St. Clair Avenue
Toronto Ontario

August 21, 1974

Mrs. Gordon Day
Brougham
Ontario

Dear Mrs. Day:

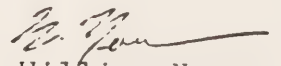
Thank you for your letter of August 7th outlining some questions you have in regard to Workmen's Compensation.

I have sent a copy of your letter over to the Board as they are better equipped to answer your questions. I have also requested that they send you the name of someone you could contact with future problems.

I trust this will prove satisfactory. If not, let me know and I will see what else I can do.

Kind personal regards,

Yours sincerely,


William Newman

2 Bloor Street East
Toronto, Ontario
M4W 3C 5
Telephone (416) 965-8804

The Workmen's Compensation Board



. August 29, 1974.

Mrs. Frances Day,
Brougham, Ontario.

Dear Mrs. Day:

Claim 9410369

I acknowledge receipt of your correspondence of August 7th, 1974.

Please give me the opportunity to obtain a complete resume from our Computing Service Department in relation to the total compensation benefits made to date. Please be assured as soon as I have a detailed summary, I will correspond with you again.

For the purpose of calculating the compensation basis, it was necessary for the Board to request, from Johns-Manville, a statement of your husband's gross earnings for the twelve month period immediately prior to his disability. Mr. Day was receiving the maximum amount of compensation in effect at the time the compensation was awarded and in such cases there is no entitlement for the increase, the maximum is only considered at the time the disability occurs. Unfortunately, there is no provision in the Ontario Workmen's Compensation Act for assistance with OHIP payments.

Please feel free to call me for any assistance in the future at the telephone number recorded above.

Yours very truly,

ADJUDICATION BRANCH

J. C. Hutchinson,
Assistant Claims Supervisor.

sg

c.c. Susan Scott
Ministry of Environment

2 Bloor Street East
Toronto, Ontario
M4W 3C 5
Telephone (416) 965- 8804

The Workmen's Compensation Board



September 11, 1974

Mrs. Frances Day
Brougham,
Ontario

Dear Mrs. Day:

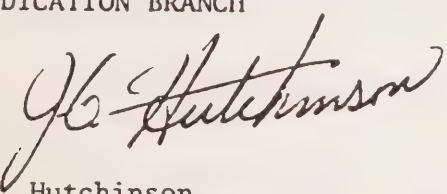
Claim 9410369

Further to my correspondence of August 29, 1974, for your convenience I have enclosed a complete resume of all cheque numbers, the amount, payment date, date of issue since June 6, 1973 until the present time.

I have arranged for a long term form of payment to be issued and it is expected that there will be no further confusion in the future. I can only apologize for the mix up that did occur in the past.

Yours very truly

ADJUDICATION BRANCH


J. C. Hutchinson
Assistant Claims Supervisor
br

W. H. FRANCOMBE, M.D., F.R.C.P. (C)
UNIVERSITY WING
TORONTO GENERAL HOSPITAL
TORONTO, ONTARIO
M5G 1L7

September 30, 1974.

Mrs Frances Day,
BROUGHAM, Ontario.

Dear Mrs Day:

I remember your husband quite well. I later spoke with your Doctors in Oshawa and arranged for Mr. Day to see Dr. Simpson at the Princess Margaret Hospital. I am sorry that it has become necessary to stop the treatment.

It is my understanding that it is possible for cremation to be carried out without the usual funeral service. To make the necessary arrangements you should speak with a Funeral Director.

It is very kind of you to suggest that donations be made for use in research. I would be pleased to make the necessary arrangements for donations to the University of Toronto, Department of Medicine, Research Fund.

I found your husband an unusually pleasant and understanding man and it was a privilege for me to see him. I am sorry that there is so little that Medicine has to offer him.

Thank you for writing and if there is anything further I can do please let me know.

With best regards,

Yours sincerely,

WH Francombe

WHF:sg

W. H. Francombe, M. D.



The Workmen's Compensation Board

2 Bloor Street East, Toronto, Ontario M4W 3C3

Telephone (416) 965-886

Michael Starr
Chairman

14 November

Mrs. G. Day,
Brougham, Ontario.

Dear Mrs. Day,

Claim No. 9410369

I have received your letter of November 9th, 1974, regarding the rate of pension paid to your husband. As soon as I have had an opportunity to review his file I will communicate with you again.

Yours sincerely,

Michael Starr

Brougham, Ont.
Dec. 6/74

Mr. M. Starr, Chairman
Workmen's Compensation Board

Dear Sir:

Re Claim S9410369 - Gordon Day

Thank you for your letter of November 29th, 1974, reviewing Gord's claim. The facts re the amount of weekly compensation paid to disabled workers I have seen several times before. However, I do not agree with paragraph 1 on page 2. It is true that Gord was off work from April 4, 1973 but after a biopsy, innumerable tests, several subsequent hospital stays with further surgery, during which our family doctor and Dr. D. Smith of the Oshawa Clinic who is an internal medicine specialist, could not identify the cause of Gord's continued malaise, they finally suggested that he visit the Johns-Manville Company doctor - Dr. Corson of West Hill, Ontario. Gord did this early in January of 1974. Dr. Corson talked to Gord briefly and said he would return to work and that he could choose any job he wanted (for which he was qualified) in the plant. When Gord told Dr. Corson that Dr. Smith said he could return to work only if he worked where there was no asbestos dust, Dr. Corson replied, "Once you've got it (asbestosis) you've got it and it won't harm you to work in the dust". This conversation was reported to your Tribunal when Gord's case was heard at the appeal in Toronto in February 1974. After several months deliberation, the appeal ruled in Gord's favour and he was awarded full retroactive compensation; but from early January 1974 until March 20, 1974 he literally dragged himself to work every day except Feb. 7 or 8, the day his appeal was heard. This period covered 10 weeks which you can verify through Johns-Manville. To say that Gord has not been employed since April 1973 is untrue. Johns-Manville considered him an employee until the date of retirement for health reasons, which was October 1, 1974.

Mesothelioma is a dreaded, painful disease. Surely legislation could be implemented to compel employers to ensure that their employees, who are unfortunate enough to contract a disease that can only be attributed to a particular product (in this case asbestos), do not lose their income as well as their health.

Copies of this letter will be sent to Mr. W. Newman, our M.P.P., Mr. Frank Miller, Provincial Minister of Health, Dr. Chas. McIlveen, Dr. M. Dymond, and Dr. Shylman, who are members of the provincial legislature as well as medical doctors.

I hope you will see fit to review this claim once more.

Sincerely,

Eric S. (Frank) Day

PROOFS OF DEATH — PHYSICIAN'S STATEMENT

To be Obtained by Claimant and Submitted to



CUNA MUTUAL INSURANCE SOCIETY

P.O. BOX 43 — KAMRTON, ONTARIO

The Medical certification follows the recommendations of the World Health Assembly made in Geneva on July 2 1948. It has been accepted by all States in the United States and all Provinces in Canada.
In the interest of accurate vital statistics, please conform to the International List of the Causes of Death.

Full name of deceased	DAY Gordon	Date of death	Dec. 21/74
Residence at death	Brougham Ont.	Place of death	
Age at death or date of birth	June 2 / 22	(If Hospital or Institution, give name)	

<p>Cause of death (Enter only one cause for each of a, b, and c.)</p> <p>Disease or condition directly leading to death: (This does not mean the mode of dying, such as heart failure, asthma, etc. It means the disease, injury, or complication which caused death.)</p> <p>(a) Malignant Melanoma</p> <p>Antecedent causes. (Morbid conditions, if any, giving rise to the above cause (a) stating the underlying cause last.)</p> <p>Due to (b) Ectopic</p> <p>Due to (c)</p> <p>Other significant conditions: (Contributing to the death but not related to the disease or condition causing death.)</p>	<p>Interval between onset and death</p> <p>(a) 1 year</p> <p>(b) 3 yrs</p> <p>(c)</p>
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Date of First Attendance in last illness	20 Apr 74	Date of Last Attendance in Last illness	20 Dec 74
Death was due to accident, suicide or homicide, specify which. Describe briefly.	<p>Was an inquest held? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Was an autopsy performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Ottawa General Hospital</p>		

Have you treated or advised the deceased during the last 3 years, prior to last illness?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Did the deceased, to your knowledge, receive treatment during the last 3 years from any other physician, or in any Hospital or Institution?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Yes to either question, please furnish the following:

Name	Address	Nature of Illness or Injury	Date
Dr. D. Smith	Ottawa Clinic	Stroke	13.1.75
Dr. J. White	Toronto General		

<p>Signature</p> <p>W. R. Crampton</p> <p>Address</p> <p>Brougham</p>	<p>MI</p>
---	-----------

W. H. FRANCOMBE, M.D., F.R.C.P. (C)
 UNIVERSITY WING
 TORONTO GENERAL HOSPITAL
 TORONTO, ONTARIO
 M5G 1L7

January 8, 1975.

Mrs Frances Day,
 BROUGHAM, Ontario.
 LOH 1A0.

Dear Mrs. Day:

Thank you very much for your letter. I was sorry to hear of your husband's passing.

I have already received a number of donations from your friends and family. These donations have been deposited to the Professor of Medicine Research Account in the University and I expect that receipts and acknowledgements will be sent to the donors. I am afraid I have not kept a list of the donors myself but I will ask the secretary in the University in charge of the Research Accounts to provide you with such a list.

I do thank you and your friends for your generosity and if there is any further information, I can provide please let me know. You might be interested to know that Dr. Gray,* whom I asked to see your husband when he was in the Toronto General Hospital, has recently become a member of a Government Commission studying pulmonary diseases related to industrial exposure.

With best regards,

Yours sincerely,

W. H. Francombe

WHF:sg

W. H. Francombe, M. D.

* letter to Dr Gray, Feb 5/75 -
 with copy of letter to J. McBeth, Minister of Labour



LEGISLATIVE ASSEMBLY

Rm. 212, North Wing
Parliament Buildings
Toronto, Ontario

January 17, 1975

Mrs. Frances Day
Brougham, Ontario

Dear Mrs. Day:

Thank you for your letter concerning your husband's experiences with the Workmen's Compensation Board.

I agree with your comments; unfortunately, I and my colleagues of the N.D.P. have been unable to convince the Conservative government to make the necessary changes in the Workmen's Compensation Act.

However, we will continue to push for change in the legislation needed to give the injured workman the compensation benefits he so rightly deserves to meet the ever rising cost of living.

Yours sincerely,

MS:ST

Morton Shulman
Morton Shulman, M.D.
MPP for High Park
New Democratic Party.

Birmingham, Ont.
January 21/75

Dear Foly:

Having thought about this for some time, may I be permitted
some constructive criticism.

You, Bruce Machin and Mr. Neilson all heard Rev. Alex
Robertson say that Gord felt no bitterness because of his circumstances.
But - He was deeply hurt by the lack of visitors at both Company and
Union Executive level.

Gord and I both know for nearly eight months that he had
more than just asbestosis. From the various types of mass media and
the reports I have received from the doctors, there will likely be
various cases of malignant neoplasms. So some from the company and/or
the union should develop the intestinal fortitude to show more than
usual interest and have the courage to make periodic visits to long-
suffering illness, especially when they are hospitalized.

If, as you told Gord and me, the union will not "go for"
better pension plan, then possibly the company should show more in-
itiative and start a special contingency plan for those who are
partially or fully disabled. Gord found it almost impossible to
believe that his pension would amount to only about \$40.00 per month
for more than 25 years of payment.

I realize Gord was just one little number among thousands
of John-Manville employees but I believe he deserved better treatment
than he got.

Sincerely,

Copies to: Mr. Neilson, President
I.C.W.U., Local 346

A.J. Thompson, Sec. Treas.
I.C.W.U., Local 346



LEGISLATIVE ASSEMBLY

Room 212, North Wing
Parliament Buildings
Toronto, Ontario

January 22, 1975

Mrs. Frances Day
Brougham, Ontario

Dear Mrs. Day:

Thank you for your letter of January 7th commenting on a recent Provincial Affairs telecast in which I talked to some of the miners in Elliot Lake about the silicosis and lung cancer from which many of them suffer as a result of working in the uranium mines.

I was deeply sorry to hear of your late husband's illness as a result of his work with Canadian Johns-Manville. As you know, the health hazards of asbestos are being increasingly recognized, though it is unlikely that the government will move to provide protection for the workers unless they are pushed into it by public demand.

I am not quite clear from your letter whether you and the children are now in receipt of Workmen's Compensation as a result of your husband's death. If not, and you would like me to look into the matter, I would be glad to do so. All I would need would be your late husband's Workmen's Compensation claim number.

The situation in Elliot Lake is now in the hands of a commission which started its hearings this month. Right now, members of the commission think that it will take approximately 18 months before their work can be completed and a report can be made. I know that we will all await it with great interest.

Yours sincerely,

A handwritten signature in cursive script, reading "Stephen Lewis".

Stephen Lewis, MPP
Ontario Leader
New Democratic Party

opeiu:343

P.S. It certainly is a savage irony that on top of everything else, the absurdity of the Pickering airport should

Brougham, Ont.
January 29/75.

H. J. McBeth, M.P.P.,
Minister of Labour

Dear Sir:

Re: Workmen's Compensation

Background Information

My husband, Gordon Day, was ill for more than 2 years before he died on Dec. 1/74. During that time he had innumerable tests, x-rays, biopsies, and major surgery. From April 1973 - December 1974 he was admitted to 3 different hospitals for a total of 10 times. A biopsy in April 1973 proved he had asbestosis. He had been employed at Canadian Johns-Manville since May 1968. Some who are found to have asbestosis recuperate sufficiently to lead a restricted but more or less normal life. He did not. Instead he went from one painful illness to the next with four family doctors and an internal medicine specialist unable to pinpoint the exact cause of trouble. Further exploratory surgery in September of 1973 did little to alleviate his confused distress. In early January 1974, Dr. Grant and Dr. Smith went to visit the Johns-Manville company doctor thinking, I believe, that a change to work in an area of the plant where there was no asbestos dust, just might make him feel better. The company doctor told Gord that he could take any job he thought he could handle (seniority counts) in the whole plant. When Gord stated that his doctor had stipulated "no dust" the doctor said "Once you're free of asbestosis, you've got it and working in the dust won't harm you any more". He gave a job he thought he could work at with no little dust as per doctor's order. Gord returned to work on January 14 after an absence of approximately 9 months. He worked about 10 weeks but in his weakening condition he could not keep his mind any longer and finally looked off sick.

After the lung biopsy in April 1973, the Workmen's Compensation Board awarded 50% compensation until mid June 1973 when they felt he should be sufficiently recovered to return to work. Because he was hospitalized again in May and in June he couldn't return to work but they cut his compensation to 50% and he continued to receive this amount until he was able, with the help of Bill Newman and our lawyer, to have his appeal heard on February 8, 1974. The appeal was successful and once again we had to wait several months before the retroactive compensation came through. On each of these two occasions I wrote several letters to activate the sleeping lethargy of the W.C. B.

In May of 1974, after yet another series of tests and a biopsy on a nodular abdominal mass, we learned that Gord had malignant mesothelioma, a relatively rare form of cancer that only those who breathe in asbestos dust on a continuing basis, get. A Workmen's Compensation report (a copy of which is attached) dated July 24, 1974 states there were a number of J-M employees receiving compensation for this industrial disease. At the onset of Gord's application for W. C., the plant nurse told they had to send the figures for the amount of Gord's gross earnings for the two full years of employment and that his compensation would be based on this. It turned out there is a maximum and because he began to receive compensation on July 1, 1973 his maximum was \$129.62 per week, which seems to have nothing

never to do with gross earnings. However, after reading several articles in the papers re compensation and one in particular praising Mike Starr and his accomplishments as chairman of the W.C.B., I began another campaign of letter writing last fall directed at that gentleman. Once more he replied that Gord was entitled to more compensation as he had not worked since April 1973. I was quite discouraged by this and almost gave up but decided to have one more try. At the time I pointed out the inaccuracy of his letter and sent my reply to him with copies to Bill Newman who is our M.P.P., Frank Miller, Minister of Health, and to the only three doctors whose names I knew who were also M.P.P.'s - Dr. Dymond, Dr. McIlveen and Dr. Shulman. Dr's Dymond and McIlveen replied almost at once. Dr. Dymond stated that he would get in touch with the W.C.B. and Dr. McIlveen agreed with my conclusions and stated that he would pass the information on to you as the W.C.B. came under your ministry. Dr. Shulman sympathized with my views but felt there was little he could do except push for changes in the legislation of the Ontario government. Bill Newman also passed the word along to W.C.B. Frank Miller did not reply.

I finally won my point but it turned out to be a hollow victory because less than a week after receiving the retroactive compensation of approximately \$1,000 per week, bringing his weekly rate to \$144.00, Gord died. Now my husband's bill will get only \$260.00 per month and \$70.00 for my daughter.

Something is dreadfully wrong here. Surely there must be something in the law that will require a company to pay sufficiently high rates (compensation) so that a family will not suffer financially when a person dies because of a disease that can only be directly attributed to their employment. It seems I have been pleading for such a long time and no one should have to grovel for a fair deal.

I work part time as a school secretary. I do not want to have to look for a full-time job at the present time as I have an almost 12 year old daughter who has had the traumatic experiences that only an illness of this kind produces and I do not want to leave her alone any more than is absolutely necessary. We live in a house that has been expropriated for an unwanted airport and I have no idea in which direction we will move in the future, which further adds to my dilemma.

Legislation must be passed that provides a decent and fair sum of financial aid to families who are bereaved because of something over which they have no control; the silicosis sufferers of the mining communities and the people who work with asbestos or its dust. Employment applications should have the words "employment here may be injurious to your health" in large letters. My husband was the first employee of J-M at Port Union to die because of this illness. He will not be the last. Statistics show that in most cases asbestosis takes 10-25 years to show up. I understand that there are two more J-M employees who are now quite ill, one of whom I have met and the other one I do not know. If families have my sympathy, they will likely need it.

I feel very strongly about the seeming lack of concern shown by the provincial government for allowing these flagrant conditions to exist and cannot see why it will take more than a very few weeks (at most) to legislate against these gross injustices. All of the many doctors concerned with Gord's care will gladly provide you with any documents you require. Dr. Wm. Francombe, who heads up the Asbestos Research for the University of Toronto, can be contacted at the Toronto

General Hospital if you so desire.

Not only does the general cost of living go up at an alarming rate but all the general maintenance on house, car etc., that was done by Gord, has now to be done by hired help. You don't have to be an economist to know the rates that twice people charge. I will not be so noble as to say that I am not seeking more substantial help for my daughter and myself. I am, but I also hope that help may be attained by others who do not yet know that they need it.

Sincerely,

Dr. C. McIlveen
Wm. Newman, M.P.P.

There have been 35 deaths in Ontario recognized by the Workmen's Compensation Board as due to asbestosis, asbestosis and lung cancer or mesothelioma. In addition, three persons with recognized asbestosis have died from causes unrelated to this condition. Of these, ten occurred among employees or former employees of Canadian Johns Manville Company in Port Union.

The Ministry of Health has records of 53 cases of asbestosis in Ontario who are still living and who developed their disease as a result of occupations in Ontario. Of these, 22 are among employees of Canadian Johns Manville Company.

The total diagnosed represent 91 cases living and dead of asbestos-related diseases known to the Ministry of Health through our clinical work and through our association with the Workmen's Compensation Board.

Of the 22 employees living with asbestosis, all began work at Canadian Johns Manville Company between 1948 and 1953. Of the ten who died, all began work between 1947 and 1955.

The Ministry of Health has had a medical supervision program for workers at the Canadian Johns Manville Company for many years. At present, it consists of a periodic medical examination consisting of chest x-ray with lung function testing once a year. For long term employees, the chest x-ray is taken every six months.

In addition, air sampling is carried out periodically by the Ministry of Health. Air sampling is also done by the plant.

A dust collector system has been in operation since 1961 and extensive changes have since been made. Recent dust surveys by the Ministry of Health indicate asbestos fibre counts within the "threshold limit values" in most areas.

Regrettably, cases recently identified occurred in persons exposed a number of years ago before there was full awareness of the problem.

July 24, 1974

from Ministry of Health files

Brougham, Ont.
Jan. 31/75

Dear Mr. Newman:

Over the last couple of years you have helped me to make decisions with regard to helping Gord. As you can see from the attached letter which I wrote to your fellow cabinet minister, he no longer has any needs. I do. I have tried to explain why I think the law must be changed. The last three years have been very hard on most people living in this area as you well know and doubly so for some of us.

Will you please use your knowledge of the intricacies of parliamentary procedure and any other ways you have of bringing this very difficult matter before those who have the power to change the laws, through your portfolio - namely the Ministry of the Environment.

The doctors who attended Gord have volunteered to help me in any way possible and Dr. W.G.Y. Grant of Brooklin suggested that I write to you and ask for your help because you are a member of parliament and also because of the department you head up.

Once again, may I count on you for some badly needed help.

Sincerely,

Brougham, Ont.

January 31/75.

Dr. C. McIlveen, M.P.P.

Oshawa

Dear Sir:

In December 1974, I sent you a copy of a letter I had written to Mike Starr asking for your help in rectifying what I thought was an unjust situation. Your prompt reply deserved a thank you but as you read the attached you will see why it is late in coming. However, I do appreciate your helpfulness and have followed up your suggestion to write to the Minister of Labour.

Cancer strikes all kinds of people but mesothelioma hits only those who are exposed to asbestos or its dust over long periods of time. As a medical doctor you will be able to explain to your fellow members of parliament far better than I, that this is a very serious problem and that more stringent regulations between the W.C.B. and companies such as J-M, will make it more financially possible for bereaved families to live rather than just exist.

Thank you for any assistance you may be able to give, I remain,

Sincerely,



Office of the
Minister

Ministry of
Labour

400 University Ave
Toronto Ontario

February 5, 1975

Mrs. G. Day,
Brougham,
Ontario

Dear Mrs. Day,

I was sorry to learn from your letter of January 29, 1975 of your husband's death.

I believe your basic concern now is in regard to the amount of pension authorized under present legislation. This will be reviewed and I shall write to you again about it.

Meanwhile, I appreciate your bringing this matter to my attention.

Yours very truly,

John P. MacBeth, Q.C.
Minister

Brougham, Ont.
Feb. 18/75

Hon. John MacBeth,
Minister of Labour

Dear Sir:

In reply to your letter of February 5, I would like to express my real concerns.

I tried to explain in the letter I wrote to you, that I felt legislation was needed to bring forth a realistic approach to the problems of all of us who are involved in this industrial controversy.

I firmly believe, and the more people to whom I speak agree, that each worker who contracts asbestosis, silicosis or similar conditions, should be immediately compensated 100%. Any family who is bereaved, be it widow, or widow and family should receive the full equivalent of the workers' salary - and the annual increments received by the employee who takes his place in the work job until the age of the deceased worker would have been 65. Certainly the amount should be not less than the yearly gross wages that he was earning at the onset of his illness.

I'm not looking for pity, only what I believe to be just. To lose ones husband because of mesothelioma is a terrible ordeal. Without being paid, one small consolation should be the lack of worry over money.

Whether the necessary money comes from the Workmen's Compensation Board and/or the Johns-Manville Company is probably the issue that needs to be settled by Canadian Johns-Manville and your ministry through the Workmen's Compensation Board.

Yours very truly,

John MacBeth

2 Bloor Street East
Toronto, Ontario
M4W 3C5
Telephone (416) 965-8804

The Workmen's Compensation Board



. February 5, 1975.

Mrs. Frances E. Day,
Brougham Road,
BROUGHAM, Ontario.

Dear Mrs. Day:

CLAIM D 9410369 - Gordon Day, (d)

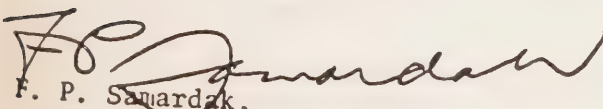
We are pleased to advise you that you are entitled to a pension of \$330.00 which will be paid on the 21st of each month.

Your pension continues during lifetime or until remarriage. If you remarry, you will receive a lump sum payment equivalent to two years pension.

The burial payment may be paid to you or any other person who paid the account providing the receipts are submitted to us. If it is more convenient, we will send the payment to the undertaker to apply against his account. Please let us know which method of payment you prefer.

Yours very truly,

ADJUDICATION BRANCH


F. P. Samardak,
Claims Adjudicator.
c.c. Cdn. Johns Manville
DD

ONTARIO T HORACIC SOCIETY

The Medical Section of the Ontario Tuberculosis and Respiratory Disease Association — Your Christmas Seal Organization

157 WILLOWDALE AVENUE, WILLOWDALE, ONTARIO M2N 4Y7

TELEPHONE 221-3483

President
DR. A. A. SCOTT
President-Elect
DR. T. E. WOOD
Immediate Past-President
DR. A. G. JESSAMINE
Executive Medical Director
DR. C. C. GRAY

February 10, 1975.

Mrs. G. Frances Day,
Brougham, Ontario.

Dear Mrs. Day:

Thank you very much for your recent letter handwritten by yourself along with the detailed typewritten letter that you wrote to Mr. J. McBeth, Minister of Labour. I also appreciated your short note about Mr. Dennis Smith who I also had occasion to look after at the Toronto General Hospital.

You are quite right in indicating that I am a member of a Royal Commission to study the health and safety of workers in mines in Ontario. I am the medical consultant advisor to the Commissioner and can assure you that I am very much involved as all advisers are with respect to our deliberations in the province.

Our actual terms of reference do not cover people who are working in industrial exposures such as the Johns-Manville Company. There are two small asbestos mines in Ontario and these will undoubtedly be covered by the Commission. However, I feel quite safe in saying that as a result of the depth of study that our Commission is carrying out there undoubtedly ^{will} be a change in policy with respect to safety and health not only at the level of the miner or worker but also with respect to management policies and governmental legislation. It would seem almost certain to me that some of the results of our study will have a beneficial effect on those who are exposed to the hazards of asbestos whether it be at the mining level or at the industrial level where the asbestos fiber is used in so many different ways.

In the terms of reference the Workmen's Compensation Board is also coming under our examination and for many of the points that you outlined in your letter. Speaking as an individual and not as a member of the Commission, I might say that in my own experience the Compensation Board has usually been very fair with respect to patients or the family of patients making claims for illnesses, accidents, etc., incurred as a result of the work carried out by the individual. Admittedly there is often a delay, often some failure of good communication as to

3 Years

J. D. BRAND - SCARBOROUGH
K. R. SINGH - SARNIA
R. D. WIGLE - KINGSTON
T. E. WOOD - LONDON

2 Years

DR. J. K. BELL - ST. CATHARINES
DR. R. J. MCGEE - LEAMINGTON
DR. D. E. SANDERS - TORONTO
DR. A. A. SCOTT - TORONTO

1 Year

DR. F. E. HARGREAVE - HAMILTON
DR. C. M. HORNER - COBOURG
DR. W. E. HUTCHINSON - S. S. MARIE
DR. A. G. JESSAMINE - OTTAWA



Mrs. G. Frances Day

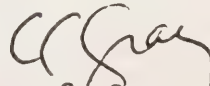
February 10, 1975.

what events are taking place and some discrepancies with respect to payment for impairment, disability or death. As you pointed out there has been a recent change which has been in favour of the compensated individual but there are probably some areas that remain that do require adjustment and particularly with respect to those claims that anti-date a recent change in the W.C.B. Act.

I can assure you once again that our commissioner is a concerned and fair man who is listening to all sides of the evidence that is being presented and I feel certain that the recommendations made to the government will show due consideration to the worker regarding his work, his safety and health hazards and compensation for those who are disabled or who die as a result of their occupation.

I might say that Dr. Francombe has been keeping in touch with me about your problems and I know that he appreciates that through you some funds have been directed towards further research with respect to asbestosis.

Yours sincerely,



Cameron C. Gray, M.D.,
Executive Medical Director.

CCG:ag



100 Alexandra Street,
OSHAWA, Ontario.

Telephone: 725-6471

Office of the
Parliamentary
Assistant

Ministry of
Transportation and
Communications

416/965-5804

Ferguson Block
Queen's Park
Toronto Ontario

3rd Floor,
Ferguson Block,
Queen's Park,
TORONTO.

February 13th, 1975.

Mrs. Frances Day,
Brougham, Ontario.

Dear Mrs. Day:

I acknowledge receipt of your letter of January 31st, with the enclosure of your letter to the Honourable John MacBeth, Minister of Labour.

Last week I was a member of the committee that had the opportunity of questioning the Workmen's Compensation Board on their activities. We heard Stephen Lewis bring up your husband's case history and his recent untimely death. Mr. Lewis did not mention any names but I recognized who he was talking about because your letter to me had been so vividly descriptive.

As you are probably aware, the results of our meetings of last week are that the Workmen's Compensation Board intends to reconsider this whole problem and I, like you, hope that some very concrete recommendations come from their reconsideration.

Again, thank you very much for your follow-up letter. It was certainly appreciated.

Yours truly,

Chas McIlveen
(per st)

C.E. McIlveen, M.D., M.P.P.,
Parliamentary Assistant to
the Minister.

CEMcI:st



ice of the
ister

Ministry of
Labour

400 University Avenue
Toronto Ontario

February 18, 1975

Mrs. G. Day,
Brougham,
Ontario

Dear Mrs. Day,

Further to my acknowledgment of February 5, 1975,
I have looked into the question of pension on
behalf of Gordon.

The Workmen's Compensation Act is quite specific
in regard to the amount payable. Sec. 36(1) reads:

"Where death results from an injury, the amount of
the compensation shall be:

- (d) where the dependants are a widow or a widower
and one or more children, a monthly payment of
\$260.00 with an additional monthly payment of
\$70.00 to be increased upon the death of the
widow or widower to \$80.00 for each child under
the age of sixteen years."

I believe you have been paid according to the above
scale since your husband's death. Should the
Legislature decide in the future to amend this
provision, it will apply equally to all pension
recipients.

Yours very truly,

John P. MacBeth, Q.C.
Minister

c.c. Hon. William Newman
Minister of the Environment

Brougham, Ont.
Feb. 21/75

Hon. Marc Lalonde *
Minister of National Health and Welfare

Dear Sir:

Early in the summer of 1974 I wrote to you with regard to the illness of my husband, Gordon Day, and my concern for the income security for disabled workmen. In your reply, you spoke of a joint review by the federal and provincial ministers responsible for social security and also the question of early retirement for those who suffer industrial disability. Well, suffer he did, but no more. He died on December 21, 1974 of mesothelioma. I do not know if Ottawa is listening to all of the controversy about the use of all forms of asbestos at Canadian Johns-Manville. There are accusations and counter-accusations by scientists and doctors about the effects of asbestos. I seem to agree that blue asbestos is the most deadly kind and the opinions vary as to the degree of harm that the other cause.

Now I implore you to have the blue asbestos banned at once. My husband, I believe, is the 11th death of mesothelioma (but he could be a higher number than that). I am now embroiled in a battle with the provincial government over the compensation widows' benefits. I want no pity. I believe he should be entitled to Gord's wages until he would have reached the age of 65. The laws are unjust and although this is probably a provincial matter (I don't know this, as I haven't found an effective way of in-fighting with a large corporation be it Canadian Johns-Manville, the provincial or federal government) the national health and welfare should be concerned with all health matters. No matter if I personally gain or lose in this dispute, something drastic needs to be done to protect other long-time employees of Johns-Manville.

There are many other men at Johns-Manville affected in varying degrees with asbestosis and I hope their families will not have to go through what I have to get some action. To lose one's husband is a severe blow, to have to worry about money is an added insult.

Yours very truly,

Gordon Day

Mr. N. Cafik, M.P.
Ontario Riding



Minister of the
Environment

416/965-1611

135 St. Clair Avenue W
Toronto Ontario
M4V 1P5

February 24, 1975

Mrs. Gordon Day,
Brougham,
Ontario.

Dear Mrs. Day:

Thank you for your letter of January 31, 1975 and the enclosed copy of your letter to the Minister of Labour.

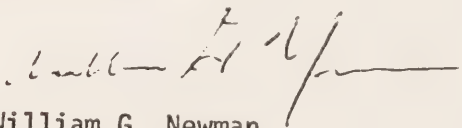
I apologize for being so slow in getting back to you, but I did want to discuss this whole question with Mr. MacBeth. Mr. MacBeth advises me, after going through your file, that you are being paid the maximum allowable under the present legislation.

I do sympathize with your situation, but the legislation is quite specific in regard to the amount of payment.

May I also say how very sorry I am about Gord's death. If any matters arise where I might be of assistance to you, please do not hesitate to give me a call.

Kind personal regards,

Yours sincerely,


William G. Newman,
Minister.

/df



Parliamentary
Secretary

Secrétaire
parlementaire

Consumer and
Corporate Affairs

Consommation et
Corporations

March 3rd, 1975.

Mrs. Frances Day,
Brougham, Ont
LOH 1A0

Dear Mrs. Day

This is just a short note to thank you for your sending me a copy of your February 21st letter addressed to the Honourable Marc Lalonde, the Minister of National Health and Welfare.

I am sorry to hear about the death of your husband and I certainly agree that you have a legitimate beef.

If you are not satisfied with the response you receive from the Minister, please do not hesitate to contact me again and I will look into the matter further.

Many thanks again for bringing this matter to my attention and with best personal good wishes, I am

Yours sincerely,

Norm Cafik, M.P.
Ontario Riding.

Brougham, Ont.
June 13/75

Mr. John MacBeth
Minister of Labour

Dear Sir:
The Ontario government have known for several years that asbestos is a potential health hazard, as witness the paragraph (a) under Safety, in the enclosed memorandum put out by the Ministry of Education, first in 1968 and emphasized again this year.

An article in the Toronto Star of June 11/75 leads me to believe that the federal government is going to ban the use of blue asbestos, the chief cause of fatal cancer or mesothelioma among the workers of Canadian asbestos mines at Port Union. My husband was one of the men who have died of mesothelioma and I have great interest in knowing if the provincial government of Ontario has seen fit to amend in the legislature, the law governing the Workmen's Compensation paid to a widow/widower who has been bereaved because of asbestos.

The banning of asbestos is something I have been working for and I would like to see greater benefits paid to the families of men who have died from asbestos or silica dust.

While it is possible my views are biased, I sincerely believe that these hitherto unseen or unpublished dangers of lethal dust merit close and swift attention and that adequate compensation should be awarded to the families of men who are no longer here to support them.

Sincerely,

to
W. Newman, Minister of the Environment
F. Miller, Minister of Health
C. McIlveen, M.P.
S. Lewis, Leader of the N.D.P.
R. Nixon, Leader of the Liberal Party

Unfortunately, I have only one copy of the Minister of Education Memo. However, the text is as follows and I expect you can obtain an original from the Ministry without difficulty.

1974-75: 37

Memorandum to : Regional Directors of Education
Directors of Education
Principals of Schools

Re: 1. Safety

(a) Use of Asbestos Powder in Schools
(Ref. Memorandum 1968-69:21)

1. Safety

(a) Use of Asbestos

Memorandum 1968-69:21, dated November 29, 1968 advised that the use of asbestos powder in all schools be stopped. This action was taken on the basis of research at that time speculating on the material having qualities detrimental to health. More recent research, and events, tend to confirm these earlier indications.

It has not been brought to the attention of the Ministry of Education that any schools are using asbestos powder as a modelling medium, or for any other purpose. However, as a precautionary measure, and in view of staff turn-over since the 1968 memorandum, the attention of teachers is drawn to the previous indication that asbestos powder should not be used.



Ontario

Telephone: 965-5601

ce of the
liamentary
istant

Ministry of
Transportation and
Communications

416/965-5804

Ferguson Block
Queen's Park
Toronto Ontario

3rd Floor,
Ferguson Block,
Queen's Park,
TORONTO, Ontario.

June 17th, 1975.

Mrs. Francis Day,
Brougham P.O.,
BROUGHAM, Ontario.

Dear Mrs. Day:

I acknowledge receipt of your letter of
June 13th, the original having been written
to the Honourable John McBeth, Minister of
Labour.

I must admit that I, personally, look very
favourably upon the conclusions you draw in
your letter.

I appreciate being kept informed of your
efforts on behalf of all the families that you
know have suffered because of asbestos poison-
ing.

Yours very truly,

Chas McIlveen

C.E. McIlveen, M.D., M.P.P.,
Parliamentary Assistant to
the Minister.

CEMcI:st



LEADER OF THE OPPOSITION

Parliament Buildings,
Queen's Park,
Toronto, Ontario
M7A 1A2

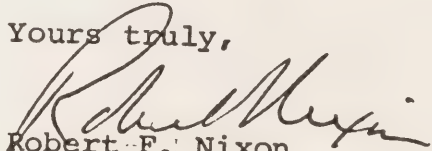
June 19, 1975

Mrs. Frances Day,
Brougham, Ontario

Dear Mrs. Day:

Thank you for sending me a copy of your letter to the Minister of Labour regarding government policy for compensation in circumstances involving Asbestos. I am glad to be kept informed in this terribly important matter, and I can assure you of our support in this connection.

Yours truly,


Robert F. Nixon

Brougham, Ont.
June 27, 1975

Mr. William Davis

Dear Sir:

The news media has indicated that you are interested in hearing from people living in Ontario re the rise in the price of gas and oil for heating and transportation. I am pleased to add my few words to others you may have heard from. We of us who live on limited incomes are finding it increasingly difficult to cope along in all respects. You may be aware that there are some families who have lost the chief wage earner in the family to the unseeable horror of asbestos. I have read recently that widows are to receive 10% more Workmen's Compensation beginning in July. No bereaved family should receive less than the asbestos or silica wage earner was grossing when he/she worked, and the compensation rates paid by such employers should be sufficiently high to deter their thinking that their compensation is worth more than said employee's lives. It costs just as much to put a roof over the heads of 2 people as three. Apart from food and clothing, costs are the same, - possibly more for the widowed when the costs of services and maintenance jobs, normally done by the husband are taken into account.

Workmen's Compensation for asbestos and silica workers is a totally different concern than for person who breaks a leg. The men, and at least one woman, suffering varying degrees of disability from asbestos and receiving compensation, numbers approximately 80 at the Johns-Manville plant in Scarborough, this does not include the men who have already died.

To say that men who smoke have a greater chance of being harmed by the asbestos may be true, but this is not necessarily so, as witness the fact that my husband had never smoked. He had confirmed asbestosis but died of mesothelioma - particularly malignant form of cancer caused by the continued inhalation of asbestos, which in turn invaded the peritoneum.

Research I have been doing, leads me to believe that Johns-Manville has been aware for several decades of the lethal effects that asbestos has for some workers. Yet the workers were never warned of the possible serious risk when employed and the periodic medical check-ups, and only have been told such things as "you're a bit too much" or "it's just a touch of arthritis", or as in my husband's case - "you've got it, you've got it and it won't harm you further to work here".

I do not wish to be a parasite and I do work part time. I do not believe it should be necessary for anyone who has been bereaved in this way to have to support several such women (asbestos widows) who live relatively close to me have children ranging in age from 6 years to early, and some in mid-teens now were not teen agers yet when their fathers died. It should not be necessary for any of us to neglect our children in order to work. Surely swift legislation should end the dilemma and worry that we are faced with. It shouldn't take more than a year to decide that this is truly a situation unique to workers or their families who are exposed to these mineral dusts.

My own situation is compounded with your government's acquiescence to the local government's wishes to build a mini airport in this area and thus I lose my home as well and will be forced to move to an area farther from my place of work and thus driving up my automobile operation costs farther.

- 2 -

I urge you and your government to take a strong position with the
panies involved with these hazardous products and bring an end to what looks
pretty dim prospects at the present time for those of us who are in this
situation.

Yours very truly,

Frances Day

Robert Nixon, Leader of the Liberal Party in Ontario
Stephen Lewis, Leader of the N.D.P. of Ontario

- rough copy, used
(Oct. 9/75)

Mr. Betty Stephenson,
Minister of Labour
Museum Park
Toronto, Ontario

Dear Mr. Stephenson -

For several of the early months of 1975,
carried on, sometimes lengthy, correspondence,
with several members of parliament including
my predecessor the Hon. John MacBeth, ~~with~~
regarding ~~to~~ several aspects of Workmen's Compensation,
occupational health hazards, such as those
produced by asbestos dust and silica dust
and chemicals used in various ^{types of} manufacturing
~~processes~~, are being scrutinized and studied
to great length. While this is going on, it
seems to be an unnecessarily slow process
especially to those whose health is preparably
~~harmful by asbestos or asbestos~~
to the widows of those who have died of
lung cancer or of mesothelioma.

The Industrial Safety Act, O. Reg. 259/72
and amended by O. Reg. 335/75, Part 5, subsection
4) seems to me to state that if a person has

he should not work in that environment again. This
is my own interpretation of this regulation and
if it is correct, then I suspect that 50 or more
new employed at the Canadian Jaws. Manville
Plant at Port Union are having their rights
infringed by that Company when in fact
they should be immediately ~~placed~~ placed on
100% compensation. It is time that laws
should be enacted so that 100% compensation
means just that. Those men should receive
monies equivalent to their wages paid on their
latest job in the factory, until retirement age
is reached. To expect a married man, possibly
with dependent children, to live on little more
than \$1000. per year and be faced with the
added worry of poor health is cruel in
these inflation ridden times. To reiterate my
feelings - companies who use products which
are known to be health hazards must pay
sufficiently high compensation rates to cover
the cases of persons who are faced with these
problems.

Similarly, we who are widowed should be
treated in a comparable way. \$286. per widow \$17
per dependent child does not go far towards keeping
family together. Not every widow is capable of holding
a mill property for after going through several agonizing years that



Office of the
Minister

Ministry of
Labour

400 University Ave
Toronto Ontario

July 3rd, 1975

Mrs. Frances Day
Brougham
Ontario.

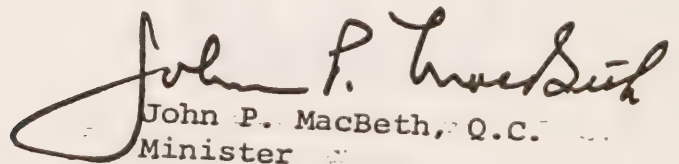
Dear Mrs. Day:

Further to your letter of June 13th, you have probably seen the announcement in the press of the proposed increased allowances under the Workmen's Compensation Act. Under the proposed legislation, the pension for a dependent widow will be raised to \$286.00 monthly, and a dependent child's pension will be \$77.00 monthly.

Regarding blue asbestos, we have been advised of the Federal Government's intention to ban the importation of this substance into Canada, but at the moment no final date has been set for the implementation of such a ban. The hazards from the use of asbestos in industry are probably not limited to blue asbestos and the Province of Ontario has been reviewing continually the standards regarding the use of all types of asbestos. In recent years the threshold-limit value has been reduced on more than one occasion and a further reduction is being considered at the present time.

I appreciate your concern in this matter.

Yours very truly,


John P. MacBeth, Q.C.
Minister



LEGISLATIVE ASSEMBLY

Room 212, North Wing
Legislative Buildings
Toronto, Ontario

July 4, 1975

Mrs. Frances Day
Brougham, Ontario

Dear Mrs. Day,

I really appreciate having a copy of your letter to Labour Minister MacBeth drawing to his attention the potential health hazard of asbestos.

Unfortunately, the Minister didn't listen to your plea and though the widow's pension has been increased from \$260 to \$286 per month, there is still no recognition of the problems faced by widows of Workmen's Compensation claimants and particularly widows of men who died from the effects of work with asbestos. I spoke of this during debate of the bill and I'm enclosing the Hansard which contains my remarks. You will note that I urge the Minister to give special consideration to widows like yourself. Alas, with the Tory government, my pleas probably fall on barren ground, and all we can do is hope things will change after the next election.

With best wishes.

Yours sincerely,

A handwritten signature in cursive script, reading "Stephen Lewis".

Stephen Lewis, MPP
Ontario Leader
New Democratic Party

OPEIU:343



Office of the
Minister

Ministry of
Labour

400 University Ave
Toronto Ontario
M7A 1T7

December 2nd, 1975

Mrs. Frances Day
Brougham, Ontario

Dear Mrs. Day:

Thank you for your recent letter regarding occupational health hazards and the Workmen's Compensation Act.

The plant at Johns-Manville is inspected regularly by officers from this Ministry and from the Ministry of Health, and all asbestos levels at the plant are well below the strictly enforced level which was set by the Industrial Safety Branch of this Ministry. I realize that there are workers still at Johns-Manville who are suffering from asbestosis, but they are continuing to work there through their own choice, and although the Workmen's Compensation Board can encourage and help them to find other employment, it cannot force them to leave the plant.

The whole problem of industry related chest diseases is under intensive study by both the Ministry of Labour and the Workmen's Compensation Board, and it is a problem which concerns me deeply. However, I think I should point out that compensation payments are considered to be replacement remuneration for an injury received while on the job. I have some doubt that it would be practicable to amend the Workmen's Compensation Act so that compensation for workers assessed as totally disabled would equal the wages which they had been earning. At present, the rate is 75% of the current wage rate.

I believe that our major concern should be in the area of Occupation Safety to reduce the hazards on the job, thereby minimizing the possibility of workers becoming disabled.

Thank you for writing to express your views.

Yours very truly,

Bette Stephenson, M.D.
Minister

Dear Mr. Lewis

I wrote the attached two weeks ago.

Now I see that you were even busier than I thought. However, because my interests are so deep, I've decided to mail it anyway.

Thank you once again for the trouble and expense by your office team probing all the things the Government seems intent to keep under wraps.

Yours truly,

Francis B. P.

248

In the year since I first wrote to you, I have spent much of my time trying to get writing on my first love, the field of professional health human rights. The letter calls for a response.

[illegible]

... who have been confined for one or several years, etc., and
to the Secretary of Health about 1900-1901, etc.
... R. ...
... of ...
... the ...
... you ...
... to ...
... government ...

[illegible]

... only have known no better.

On February 16th, I received a letter from Dr. G. L. S. G. G. G.,
Professor of Epidemiology and Health, of McGill University, in reply to
my query of the research re asbestos and related diseases, being
done by a team of doctors at McGill. The last paragraph of his letter
is a direct quote - "I believe that by sufficiently strict control in
industry, these diseases - asbestosis, lung cancer and pleural effusion,
with the exception of mesothelioma, can be controlled. I feel less
optimistic about mesothelioma and for this reason would recommend the
removal of a worker from the plant if he had been exposed to asbestos
and the removal of the worker in any situation where the risk is high."

Financially I am personally better off now than last year, but I have
a full-time rather than a part-time job even though I drive to work
every day to get to it. There may be some J-M widows who are
fortunate and for this reason I would like to see the compensation
laws changed so that the public purse is not emptied further but rather the
companies causing the problems should be made responsible for the
welfare of the families involved. I have already
written to Arthur McNamara, Minister of Labour, suggesting that this
should be a practical answer to the problem of the families of workers
in mills or asbestos dust and that I believe should not remain in the
conditions because of Article (4) in Part II of the Industrial Safety
Act. I have also, I believe, written to the Minister of Health, but
for this case, is the Minister of Health, provided that I will
contact the office again re this matter.

I hope that Dr. G. L. S. G. G. G. will be able to help me in my
research on Occupational Health risks, and I am sure that
in the future, I wonder if you have heard of any other cases.

I am sure that your efforts to provide a more viable and
workable problem would be much appreciated by all of us who are
living with this horror.

Thank you for taking time to read this.

Sincerely,

1900

Windland Lake, Kitchikowin. The horses taking to mind Northern Ontario. Each has its own unique character by colorings, each is also to the old way.

Using the facts that have surfaced since the past year to your aid, it is very difficult to believe that the people there would be so that arbiters can be anything but good. I do think it is possible that there are also some very serious disciplinary efforts on

Ken Canadian Wilson-Kinville came to Scotland in the late 40's, if any people who went to work there, knew that with exposure to asbestos of as little times as 6 months, they would become debilitated later. That company was welcomed with open arms. Now the people of Scotland and Manchester are doing the same thing. With a little help and some participating countries, we can also eliminate asbestos. Wilson's Compensation Board, Dr. Robert Bellows of the University of Edinburgh, Dr. McDonald of McGill University, Montreal, or the various people of who worked there just while the asbestos involved in this case. They are and believing that their tourist industry may look up, will give a little help to the people of Scotland and Manchester. The people of

[illegible]

...the people in those areas to do what they think is right; they will make their very ecological needs felt and carried out; they will have the provincial government work with them with their assistance; and we in power will dig deep, and get it all to work.

[illegible]

1900

Wm. H. & Co.
111 No.



October 4, 1976

Ms. Frances Day
Brougham, Ontario.

Dear Frances:

Thank you for your letter of support and encouragement.

The NDP will continue to raise the issue of occupational health again and again in the legislature and on the hustings. Every day that this government refuses to act, the lives of men and women across this province are being shortened. Until we have a government that considers the health of working people a priority, little real change will take place.

I am enclosing some information that I think you will find of interest. Hope things are going well with you.

Best personal regards,

A handwritten signature in cursive script that reads 'Stephen Lewis'.

Stephen Lewis, MPP
Ontario Leader
New Democratic Party

opeiu:343
P

June 10/75

Mines union leaflet denounces province for health whitewash

United Steelworkers America issued its own in Elliot Lake yesterday to denounce one pro- by the Ontario government. The Ontario leaflet gives false reassurances mine conditions, the leaflet says.

union leaflet, titled ash, says it is ting "the real story government is hiding the miners and their es in Elliot Lake."

s sent to all Elliot homes yesterday in ce of a public meeting last night attended by Minister Frank Miller, Minister of Natural Resources Leo Bernier and Minister John Mac-

the government pam- was sent to Elliot uranium miners last in conjunction with cease of a report on conditions. The report 46 miners had been to have silicosis or ly signs of the debili- lung disease,

en Lewis, New ratic Party leader, iller in the Legisla-

ture Monday that the government pamphlet was "so self-serving and company-oriented" that mining companies were paying to reprint it as advertisements in northern Ontario newspapers.

"The government's leaflet is an attempt to convince people that the serious health problem of the Elliot Lake mines is over," the union leaflet says.

"The (government) leaflet is full of reassuring words that cover up the alarming conditions that exist today and that threaten the health of the miners and could mean grave financial insecurity for their families."

In his speech Monday, Lewis told Miller the government pamphlet mocked the uranium miners who had died.

The union leaflet complains about the way dust and radiation levels are measured and asks the government to undertake "tough enforcement of standards."

It also says union safety committees need the right to take their own air and

radiation samples, investigate all unsafe conditions and close down operations that are too dangerous.

It criticizes the government's new policy of retraining and relocating sick miners instead of solving the cause of the problem, and government compensation to sick miners who change jobs.

Blue asbestos ban planned by Ottawa

OTTAWA (CP) — The federal government tends to ban the importation of blue asbestos and sale of products containing free asbestos fibres.

Through regulations under the Hazardous Products Act, it also intends to ensure that products containing asbestos bear labels "which give information on their contents and safe use," the consumer affairs department and health department announced yesterday.

Exposure to "free asbestos fibres is a potential health hazard which can result in cancer . . . Experience outside Canada shows the hazard may be greater with blue asbestos," the announcement said.

A number of groups, including Scarborough Council, have demanded a ban on blue asbestos which has been blamed for the deaths of 15 workers at the Canadian Johns-Manville Ltd. plant in Scarborough.

JUNE 10/75

Stiff control urged on blue asbestos cancer threat cited

Control and an eventual ban on importation of blue asbestos—branded as dangerous to health—was urged yesterday by the York-Toronto Tuberculosis and Respiratory Diseases Association.

In a telegram to federal Health Minister Marc Lalonde, the association urged the government to take "immediate steps to control the importation" of the blue asbestos, which comes from South Africa. It has been linked with cancer.

"We are absolutely convinced that blue fibres are dynamite and the villain," said Walter Davis, the association's executive secretary.

U.K. BAN

In an interview last night, Davis said the evaluation was based on opinion from all over the world, including the World Health Organization, and noted that the British had banned importation of blue fibres five years ago.

Blue asbestos accounts for 2 to 7 per cent of the asbestos used at the Canadian Johns-Manville Co. Ltd. plant in Scarborough in products such as sewer pipe.

"We're still using it in small percentages," company spokesman Tom Patterson said earlier this month, "but we're attempting to reduce it and the eventual goal is elimination."

HEALTH HAZARD

The health hazard of asbestos has been confirmed by two provincial health ministry authorities. Dr. Vern Tidey, acting director of the occupational health protection branch, and Dr. Joseph Cowle, chief of the industrial chest disease service.

Cowle said blue fibres have the ability to penetrate the lung lining, causing mesothelioma, a rare but

always fatal type of cancer.

"One would have to be blind not to admit that it's the blue asbestos that is the villain," Cowle said.

But other health authorities have said all forms of asbestos are dangerous to health, causing asbestosis and lung cancer.



Health and Welfare
Canada

Santé et Bien-être social
Canada

Health Protection
Branch

Direction générale de la
protection de la santé

Environmental Health Centre,
Tunney's Pasture,
Ottawa, Ontario,
K1A 0L2.

March 21, 1975.

Your file Votre référence

Our file Notre référence

Mrs. Frances Day,
Brougham,
Ontario.

Dear Mrs. Day:

The Honourable Marc Lalonde, Minister of National Health and Welfare, has asked me to acknowledge your letter of February 21, 1975 on the subject of blue asbestos.

The Minister and his colleague, the Minister of Consumer and Corporate Affairs, have recently indicated in the House of Commons that officials of their Departments are investigating the use of the Hazardous Products Act to control the importation and sale of asbestos, including crocidolite (blue asbestos). The use of asbestos within the Johns-Manville plant and measures to protect the workers are matters that are within provincial jurisdiction; as you know, the Province of Ontario has recently been very active in this instance.

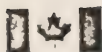
I can appreciate your deep concern in this matter and hope that some means can be found quickly to ensure that the use of blue asbestos in Canada is avoided if at all possible. An Environmental Contaminants Bill presently before the House of Commons would give the federal authorities greater powers to act in instances such as this. In the meantime, we shall continue to attempt to apply other legislation, insofar as practicable, to control exposure to dangerous substances in man's environment.

Yours sincerely,

J. R. Hickman,
Director,

Bureau of Health Hazards (Air and Water).

JRH/af



Parliamentary
Secretary

Secrétaire
parlementaire

Consumer and
Corporate Affairs

Consommation et
Corporations

• June 13, 1975

Mrs. Frances Day
Brougham, Ontario

Dear Mrs. Day:

I am in receipt of your letter of May 27th concerning the expropriation of your property for the Pickering airport project.

I delayed answering you until now in anticipation of a cabinet decision that would affect the compensation offers of the majority of expropriated residents. Monday, June 9 I was able to announce that decision. For your information, I enclose a copy of the press release and some additional information that accompanied my announcement.

I hope that you will now receive a satisfactory upgrading of your compensation offer. If this is not the case, however, there are still a number of options open to you, including negotiation with project officials, an appearance before the Official Negotiator if you have already applied to do so, or taking your case to court.

In the next few days I plan to send a memo to all expropriated residents which will further explain the decision that I announced on June 9.

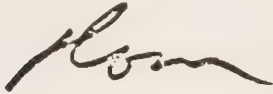
In connection with your question regarding blue asbestos, importation of blue asbestos fibres will indeed be banned shortly. I also enclose a press release on this matter

.../:

for your information.

I appreciate your writing to me again, with best personal
good wishes, I am

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'Norm', with a stylized flourish at the end.

Norm Cafik, M.P.
Ontario Riding.

Enclosure

NAC:SJT



Government
of Canada

Gouvernement
du Canada

Joint Press Release

HEALTH AND WELFARE CANADA

CONSUMER AND CORPORATE AFFAIRS

1975-85

May 28, 1975

PROPOSED REGULATIONS

ON ASBESTOS

OTTAWA - Consumer and Corporate Affairs Minister André Ouellet and Health and Welfare Minister Marc Lalonde today alerted industries and consumers to impending regulations that would ban the importation of blue asbestos (crocidolite) and the sale of consumer products containing free asbestos fibres, such as some humidifier plates, certain types of modelling clay and joint cement. The sale of non-consumer products containing asbestos would also be regulated so that they would bear labels which give information on their contents and safe use.

Asbestos is the generic name for several related minerals that differ in their chemical and physical properties. All are regarded as potentially dangerous.

Research has revealed that inhalation of free asbestos fibres is a potential health hazard, which can result in cancer. The danger exists for those living in the vicinity of plants which use asbestos as well as those working within the plants. Experience outside of Canada shows that the hazard may be greater with blue asbestos. Although blue asbestos is not mined in Canada, it is imported in small amounts from South Africa for use in the manufacture of asbestos-cement sewer and water pipes.

No danger exists for consumers, however, from the presence of blue asbestos in water pipes, since these fibres are not released from the solidified asbestos-cement mixture. The hazard is primarily associated with inhalation of these fibres during the handling or manufacturing process. For this reason, the Ministers asked industry to make changes in their processing which will eliminate the use of blue asbestos as soon as possible without depleting the supply of asbestos-cement pipe to municipalities where it is essential and to accelerate current efforts to introduce control procedures during the manufacturing process to prevent the circulation of free asbestos fibres in the atmosphere.

The labelling of other forms of asbestos and non-consumer products containing asbestos would alert workers, unions, management and the public. Proper precautions could be taken to avoid inhalation of dust from these sources.

The Ministers indicated that the new Hazardous Products Act regulations would be announced shortly.

Ref: René Mercier (Health and Welfare)
(613) 996-0446

J. Cohen (Consumer and Corporate Affairs)
(819) 997-3146



Office of the
Minister

Ministry of the
Environment

416/965-1611

135 St. Clair Avenue
Toronto Ontario

July 3, 1975

Mrs. Francis Day,
Brougham,
Ontario.

Dear Mrs. Day:

Thank you for your letter of June 13, 1975 concerning the hazards of asbestos.

Although the Ministry of the Environment is not directly responsible for working place conditions inside asbestos plants, we are all deeply concerned about the danger to health of exposure to asbestos dust, whether through occupational or community contact.

To determine the level of community exposure to asbestos, both white and blue, this Ministry is carrying out an extensive survey of all sources of asbestos emissions to the air in the Province which will be complete this summer. We have operated an intensive surveillance of the Johns-Manville Scarborough plant for some time, both immediately adjacent to the plant property and in the surrounding community. Recently we completed tests of the exhaust air leaving the emission control machinery of the plant itself. The results of all of these tests show that emissions of both white and blue asbestos from the Johns-Manville plant are very low and considerably below the Province's strict guideline for asbestos emissions.

We are convinced that, on the basis of current understanding, there is an extremely small risk to any member of the general public from these low asbestos emissions. Medical researchers do not know enough about the health effects, particularly related to mesothelioma and lung cancer, of these low concentrations of asbestos fibres in the air to say that there is no risk, only that it is extremely small. For this reason, several branches of this Ministry have personnel continually searching for better information, for more sensitive sampling and analytical procedures, and for more efficient control technology to reduce the community exposure to asbestos still further. We are considering now more stringent regulations on the emission of asbestos, particularly amphibole (including blue) asbestos. We intend to establish tighter control of

- 2 -

asbestos emissions as soon as we have sufficient information about current levels of asbestos in the environment, about control technology and about the relative hazard from white and blue fibres. This action is necessary because the federal ban on importation of blue asbestos will not take effect for some time.

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'William G. Newman', with a long, sweeping horizontal flourish extending to the right.

William G. Newman.



HOUSE OF COMMONS
CANADA

17 June 1976

Mrs. Frances Day
BROUGHAM, Ontario

Dear Mrs. Day:

Further to your enquiry about blue asbestos being used by Johns Manville, enclosed you will find a report I have just received from the Ministry of Consumer and Corporate Affairs.

I hope that this response is satisfactory to you and if you have any comments, do not hesitate to let me know.

Many thanks for bringing this matter to my attention and with best personal good wishes, I am

Yours sincerely,

A handwritten signature in dark ink, appearing to be 'Norm Cafik'.

Norm Cafik, M.P.
Ontario Riding

NAC/pas

Enclosure



Consumer and
Corporate Affairs

Consommation et
corporations

Consumer
Standards
Directorate

Direction
générale
des normes

JUN 2 1976

Your file Votre référence

Our file Notre référence

7460-A4

Product Safety Branch
18th Floor, Zone 1
Place du Portage
Ottawa/Hull
K1A 0C9

May 31, 1976

Mr. Norm Cafik, M.P.
Ontario Riding
House of Commons
Ottawa, Ontario
K1A 0A6

Dear Mr. Cafik:

I refer to your letter of April 22, 1976 requesting information on blue asbestos as a basis for a reply to a query from your constituent, Mrs. Frances Day, of Brougham, Ontario.

Subsequent to my letter of June 13, 1975, Johns-Manville asked for a meeting with the Minister of this Department and the Honourable Marc Lalonde to discuss medical evidence the company had developed. A meeting was held and Mr. Lalonde asked that a complete report be submitted by the company for study by his officials. The report did not come to hand until late in the year and the health officials only completed their review of the document in recent weeks.

The current situation was summed up in the House on May 21, 1976 by the Honourable Marc Lalonde in reply to a question from the Honourable Martin O'Connell. For convenience, I quote from page 13752, Commons Debates, as follows:

"Mr. Speaker, a while ago the Minister of Consumer and Corporate Affairs and myself announced our intention to proceed to the banning of blue fibre asbestos. There have been consultations with the firm involved after it made further scientific

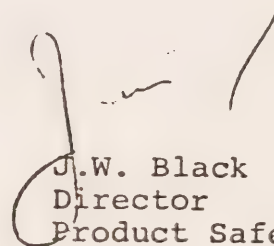
...2/

representations. We have since examined those further scientific representations. We have come to the conclusion that those representations were not of such a nature as to change our original intention. My colleague, the Minister of Consumer and Corporate Affairs, intends to make an announcement shortly on this subject, and I think he should be the one to answer with regard to this particular aspect.

As far as the latter part of the question is concerned, I am pleased to receive the representation of the hon. member with regard to the unions concerned. I will instruct my officials to make themselves available to the union officials, at their convenience, and to make available to them the scientific information we have on this particular subject."

I trust that the above provides sufficient information for a reply to your constituent.

Yours truly,



J.W. Black
Director
Product Safety Branch



November 3, 1977

Mrs. Frances Day,
c/o Brougham Post Office,
Brougham, Ontario.
LOH 1AO

Dear Mrs. Day:

Just a short note on behalf of Mr. Cafik regarding the whole question of blue asbestos.

I have been in contact with Consumer and Corporate Affairs and the Department of National Health and Welfare regarding this. As you probably realize, they have been working on this for some time, and do now have some answers with respect to it. They are forwarding these under separate cover to me, and as soon as I have them I shall be in further contact with you.

With best good wishes, I am

Yours sincerely,

Ron Huck,
Special Assistant.

RH:md



Minister of State
Multiculturalism

Ministre d'État
Multiculturalisme

December 7th, 1977.

Mrs. Frances Day,
c/o Brougham Post Office,
Brougham, Ontario.
LOH 1A0

Dear Mrs. Day:

Enclosed please find copy of letter which I have received from the Office of the Minister of Consumer and Corporate Affairs.

I trust that the information supplied in this letter will adequately answer your questions; however, if you have any further comments to make in this regard, please do not hesitate to contact me again.

Again, thank you for bringing this matter to my attention and with best personal good wishes, I am

Yours sincerely,



Norm Cafik

NAC:DHR

Encl.



NOV 24 1977

Mr. Ron Huck,
Special Assistant to the
Minister of State of
Multiculturalism,
Suite 1600,
North Elgin Plaza Building,
66 Slater Street,
Ottawa, Ontario.
K1A 0M5

Dear Mr. Huck:

Reference is made to your recent discussion with
Mr. J.W. Black during which you asked for information
on the current situation with respect to blue asbestos.

As you know, Health and Welfare Canada and this
department became interested in blue asbestos when it
was purported that high concentrations of the mineral
were to be found in the atmosphere around the Canadian
Johns-Manville cement-pipe plant in Scarborough.
Additionally, the plant union expressed concerns
through Martin O'Connell about the high cancer risk
(mesothelioma) to workers exposed to blue asbestos in
the plant. An interdepartmental committee was
established to look into the problem.

Blue asbestos, which is imported from Africa, is used
in the manufacture of cement/asbestos pipe used in water
and sewer systems. Because of certain physical
properties of the mineral, it has been considered
critical to the production of the larger sizes of pipe.
Cement/asbestos pipe, I might note, is particularly
useful in chemically-aggressive soils as found in the
prairie provinces.

During the investigation of the health problem by the
department, it became clear that an immediate ban of
blue asbestos as originally contemplated would have
caused a critical pipe supply situation. The company
was, therefore, encouraged to reduce the risk of worker
exposure and to minimize the escape of the asbestos to
surrounding areas while doing development work on
substitute materials.

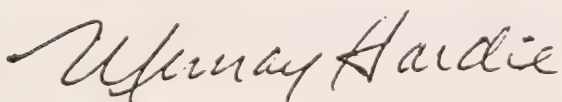
The company responded in a positive manner and introduced some very major improvements in the work environment. By way of example, blue asbestos is now received packed in heavy-walled polyethylene bags which are containerized. The bags are unloaded under controlled conditions at the plant onto a conveyor system which mechanically unpacks the asbestos into a closed system. This used to be hand operated and a probable source of plant pollution. Personal hygiene is now emphasized and workers are provided with work clothes at the plant. They now shower and change into street dress at the end of a work shift. Masks are worn in all areas where dust may be generated even though the work is done under wet conditions under a fume hood. With respect to the atmosphere around the plant, this is monitored at down-wind stations by facilities under provincial supervision. Thus, much change has taken place in the plant and the exposure hazard has been reduced to a relatively low level.

The company has also pursued matters with respect to substitutes for blue asbestos. This work has shown that cassiar asbestos mined in British Columbia can be used in lieu of the blue asbestos in pipe production. Unfortunately, the supply is under the control of another company which has committed a large part of the mine output. Energy, Mines and Resources and Industry, Trade and Commerce officials have been endeavouring to find supplies of cassiar asbestos to meet Johns-Manville requirements but have not been successful to date.

There appears to be a view at the official level that the objective of eliminating the health hazard associated with blue asbestos in the plant and its immediate environs may have been achieved. Certainly, the opportunity of exposure of dock workers and others involved in the shipment of blue asbestos has been reduced. In view of the high utility of the pipe produced from blue asbestos and what has been achieved in hazard control, it is likely that the original approach of prohibiting the importation of blue asbestos will be reexamined by the Minister in the very near future to determine if other control procedures might be more suitable in present circumstances.

I trust that the above provides the information you require.

Sincerely,



Murray Hardie,
Special Assistant.



16

SUBMISSION
TO
THE ROYAL COMMISSION
ON MATTERS OF
HEALTH AND SAFETY
ARISING FROM
THE USE OF ASBESTOS
IN ONTARIO

The Quebec Asbestos Mining Association

January 1981

SUBMISSION
TO
THE ROYAL COMMISSION
ON MATTERS OF
HEALTH AND SAFETY
ARISING FROM
THE USE OF ASBESTOS
IN ONTARIO

THE QUEBEC ASBESTOS MINING ASSOCIATION

JANUARY 1981

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MEMORANDUM PRESENTED BY THE QUEBEC ASBESTOS
MINING ASSOCIATION TO THE ROYAL COMMISSION
ON MATTERS OF HEALTH AND SAFETY ARISING
FROM THE USE OF ASBESTOS IN ONTARIO.

SUMMARY

Mr. Chairman and
Members of the Commission,

The Quebec Asbestos Mining Association is pleased to have the opportunity to present its views and comments on the asbestos/health question to the Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario. Admittedly, the hazards of asbestos fibre exposure are real, but also readily controllable and limited. The Association shares with the Public Authorities the goal of improving environmental safety and health through encouraging proper handling and use of asbestos.

One of the objectives in our memorandum is to assert that generally the Asbestos Industry in the Western world, led by the Canadian industry, has faced up to its social and ecological responsibilities and that remarkable improvements

have taken place in the last decades. The asbestos industry in the past, like so many other industrial sectors, has been confronted with health problems arising from its activities, but most of these problems have been eliminated and the remainder are in the process of being solved.

In the first place, as regards the issue of health effects of asbestos and the possible risk to the general public, our submission makes reference to the report of the study by Dr. J.C. McDonald et al published recently in the British Journal of Industrial Medicine, 1980, Vol. 37(11). One of the conclusions of this scientific research project shows that even using a sample of workers who were exposed continuously over a period of 20 years to 20 fpcc, it would have been difficult to establish an increase in risk. In an other project conducted by the Mount Sinai group, dust counts taken in urban areas, such as New York, showed that asbestos levels in the community air were many times lower (as much as 1,000 times) than levels considered to be safe for workers who actually handle asbestos.

Since such measurements within the industry suggest that an excess risk is hardly detectable with occupational exposures of 20 fpcc or so, then it would seem all the more evident when compared with the low exposures to the public from general air pollution. It is generally agreed that small amounts of asbestos fibre from natural sources - at least 50% of rock exposures in the world contain some type of mineral fibrous material - such as weathering of surface outcrops, have existed in the atmosphere for perhaps millions of years. Humans, undoubtedly, have evolved into their

III

present form in an atmosphere containing some asbestos. Indeed, the Association does not believe that the general public is threatened by asbestos/health effects, as is often claimed.

In the second place, looking back over the years, it should be pointed out that the existing criticism of asbestos in relation with health truly began with the period preceding year 1960. It is only at that time that the presence of excessive asbestos dust over a long period of time started to become scientifically and medically established as a health hazard. In the last two decades major improvements have been made in the asbestos industry; more recently, epidemiological surveys and medical reports have shown that, with dust concentrations averaging 2 fibres per cc, the health of workers is well protected.

To achieve such results in the primary asbestos industry of Québec, all equipment had to be enclosed and operated under vacuum and the majority of operations fully mechanized and automated, which required an investment of more than \$100 million in environmental control during the period 1970-1980 inclusive.

Today, in the Québec asbestos primary industry weekly personnel-dynamic and semi-annual surveys and spot sampling strategies are carried out on a regular basis using both fibre counts and gravimetric measurements. Union and company technicians work in parallel and the results are reported to Government, Union president and all employees.

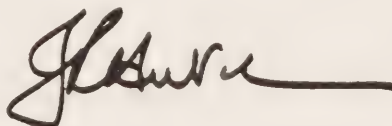
IV

A worldwide survey of the regulations concerning asbestos and health shows that most countries have adopted the basic NIOSH "Membrane Filter Method" with variations in the instrumentation and in the techniques used. At the present time a committee of worldwide experts selected by the Asbestos International Association is working on the final edition of a standard measurement method which could be used throughout the world as an official standard.

The Province of Quebec, as well as Germany and Austria, have based their regulations on a combination of membrane filter and gravimetric techniques. The Association believes that the regulation used in the Province of Québec, combining the two methods, should be given serious consideration by the Ontario Royal Commission in its research activities in co-operation with various existing organizations and agencies.

Public authorities must review their position vis-à-vis asbestos, not in terms of obsolete situations, but in the light of current technological progress and present knowledge, which make it possible to produce and use asbestos safely.

Respectfully submitted,

A handwritten signature in dark ink, appearing to be "J. H. H. H.", written in a cursive style with a long horizontal stroke extending to the right.

Quebec Asbestos Mining Association

MEMORANDUM PRESENTED BY THE QUEBEC ASBESTOS
MINING ASSOCIATION TO THE ROYAL COMMISSION
ON MATTERS OF HEALTH AND SAFETY ARISING FROM
THE USE OF ASBESTOS IN ONTARIO.

INTRODUCTION

A. QUEBEC ASBESTOS MINING ASSOCIATION

The Quebec Asbestos Mining Association incorporated under the third part of the Company's Act of Quebec, exists since 1948. It consists of asbestos producers of Quebec, grouping as of this date the following companies:

- BELL ASBESTOS MINES LIMITED
- JOHNS-MANVILLE CANADA INC.
- CAREY-CANADA INC.
- LAKE ASBESTOS OF QUEBEC LIMITED

Since its inception, the Association has aimed at encouraging a spirit of collaboration among its members, at maintaining and enlarging a spirit of cooperation and a constant liaison with the other associations, with the labour milieu and with the public authorities, for everything relating to health and hygiene at work, to the environment and to labour relations.

The Association also coordinates the asbestos mining industry's efforts to help establish and maintain uniform standards regarding the quality of the fibres.

In the fields of health and hygiene at work, of the environment, it encourages and supports technological research programs, and scientific and economic surveys.

The Association also provides financial backing for the Institute of Occupational and Environmental Health of Montréal which the former established in 1966.

These are the role and objectives of the Association. QAMA's areas of intervention are defined and demarcated with respect to the normal exercise of competition among member-companies in the domestic and international markets, and to the Canadian, American and international laws and regulations concerning trusts, cartels and competition.

The asbestos mines of Quebec produce approximately 30% of all chrysotile asbestos of the world, including Russia. As a group, these mines directly create some 7,000 jobs in the mining, concentrating and processing of the ore and 65,000 persons in Quebec depend on the asbestos industry for their living. (Alexander MRN Report - Quebec 1975) (1)

B. THE INSTITUTE OF OCCUPATIONAL AND ENVIRONMENTAL HEALTH

In 1966, the Quebec Asbestos Mining Association created the Institute of Occupational and Environmental Health. This Institute is directed by a scientific committee which groups chosen scientists from Canada, United States and Europe as the case may be, who must all have a recognized competence in the

field of health and asbestos and who must not be related in any way to any industry. (2)

Since its creation, the Institute has endeavoured to promote scientific research in the field of asbestos effects on health. The members of the scientific committee study individually each request and then meet to discuss collegially and present their recommendations to the Executive Committee of the Institute.

The Association has always acted according to the recommendations of the scientific committee. Furthermore, the subsidies granted are not given directly to the researcher, but to the Institute or University with which he is connected. Whatever the findings obtained from these research studies, the results are published. The Association has never attempted to prevent the publication of results which were not to its advantage.

The work so created and encouraged by the Association and its Institute constitutes the most important worldwide contribution to the progress of science in the field of the biological effects of asbestos.

The Institute has received more than six million dollars from the Quebec Asbestos Mining Association since 1966 to cover more than 40 research projects. (2)

These projects include first, compared epidemiological studies in chrysotile mines of Canada, chrysotile mines of Italy and anthophyllite mines of Finland. A second group of subsidies includes epidemiological studies in the asbestos-

cement industries and in shipbuilding yards. A third group includes epidemiological studies on mesothelioma among the population in general. A fourth group includes studies on the physico-chemical state and transformation of asbestos fibres during the various technological stages from the mining until the final utilisation of the product, in relation with the study of the health of workers exposed to the fibres during these various stages. A fifth group includes studies on fibre dynamics "in vivo" and of mechanisms of the biological effects of asbestos. Further groups include studies of specificity of pulmonary rales as early sign of asbestosis, asbestos in water, sputum cytology and development of techniques for measurement of chrysotile fibres. (2)

The I.O.E.H. has also received the necessary funds and authority to take measures in order to find and co-ordinate on a worldwide basis all the data and information related to the problem of asbestos and health. For that purpose the Institute had to establish new contacts and maintain existing contacts with various organizations and agencies who already had begun this type of research or who were susceptible of actively contributing to such research.

The Institute owns one of the most complete libraries in the world dealing with asbestos related diseases. This library has always been open to the public wanting information or consulting in connection with asbestos-related health problems.

C. ENVIRONMENTAL CONTROL COMMITTEE

Other than medical research, the Quebec Asbestos Mining Association contributes to the fight against dust. For many years a committee for the control of the environment with engineers and technicians specialized in this field representing each member company, has been working to improve environmental conditions. (See Appendix 1)

Even if all the companies compete on the market, they have agreed to share any information or data related to environmental control, through the help of a sub-committee on technical design, and a sub-committee on dust measurement grouping representatives from each company. Each mine experimenting a new system or a new method of dust collecting has to share the results of such experiments with the others. It agrees to open its doors to other companies and to supply sketches and specifications. This prevents duplication of effort, helps saving resources and allows for a wider spectrum of research. In fact, the two sub-committees were responsible for the selection of the continuous monitoring (APM) and gravimetric measurement (RDM 101-4) and Tyndallometer instruments presently used in the industry for internal control of dust levels.

The Environmental Control Committee financially encourages practical research in the fight against dust. For example, it initiated university research on the effectiveness of respiratory masks and on the vegetation of dumps.

Finally, the Association actively contributes to exchanging information among the various technical committees, national and international, who share the same objectives.

HEALTH EFFECTS OF ASBESTOS

1. ASBESTOS-RELATED DISEASES

The scientific medical body is totally in agreement with the fact that there are three main diseases related to the exposure to asbestos fibre. First, there is a diffused interstitial fibrosis of the pulmonary parenchyma called asbestosis. Second, there is bronchogenic cancer. Third, there is the mesothelioma of the pleura and of the peritoneum.

At the outset, two points must be clarified. First, asbestosis is not a cancer. Second, bronchogenic cancer and mesothelioma could be asbestos related diseases, but this does not imply that all bronchogenic cancers and all mesotheliomas are related to asbestos fibres exposure.

Many authors have tried to establish a relation between exposure to asbestos and other cancers, such as cancers of the larynx, kidneys, bladders, etc., but no statistically significant epidemiological study has proven the existence of this relation. The case of gastro-intestinal cancer is still very controversial.

Let us quote, what Dr. Raymond Parkes of the Pneumoconiosis Medical Panel, Department of Health and Social Security, London, England, wrote in 1974, and still very much actual:

"Unfortunately, the sensationalism with which the media deal with the question, has exaggerated the dangers of exposure to asbestos materials and the prognostics of the disease therefore creating anxiety not only among the patients who know they have asbestosis but also among asbestos workers (actual and retired), and among the public in general."
(3)

2. CHRYSOTILE

Asbestos-related diseases appear more or less rapidly according to the presence of other factors.

It is now very well established that asbestosis and lung cancer are directly related to the length and degree of exposure to asbestos. This was shown more particularly by the studies made by the McGill group, under the direction of Dr. J.C. McDonald (4 to 11), conducted among chrysotile miners and the studies of Dr. H. Weill (12, 13), conducted among asbestos-cement workers.

It is also known that the type of asbestos fibre is very important, especially in cases of cancer.

Gilson, Vigliani, Wagner and McDonald, each separately have shown the virtual absence of mesothelioma among populations exposed to chrysotile. (4)

Until now no case of mesothelioma was found to involve anthophyllite from Finland. The theory most capable of explaining the different actions of the fibres, especially in relation with asbestosis, is that which considers the morphology and the physical parameters of the fibres.

Because chrysotile is a curved and a flexible fibre, it would therefore be more easily stopped by natural defense mechanism of the respiratory track. (14)

Picture of chrysotile fibres:

CHRYSOTILE



10 μ m

Finally, cigarette is an important factor, almost a capital one in the case of lung cancer. The studies of Dr. Selikoff among insulation workers show that asbestos workers who do not smoke are no more exposed to the risk of lung cancer than the population in general.

3. PHYSICAL PARAMETERS OF ASBESTOS AND ETIOLOGY OF ASBESTOS-RELATED DISEASES

Many research studies have shown the critical importance of asbestos fibre physical parameters (length-diameter ratio) in the etiology of asbestos-related diseases.

Timbrell, in 1972, at the Lyon Conference, declared that studies made in recent years had shown that physical factors are very seriously involved in the etiology of lung diseases associated with exposure to asbestos dust. The physical characteristics of fibres which are the basis for the explanation of biological observations, are the diameter of the fibre, its length and morphology, the most important parameter being the diameter of the fibre. (15)

Gross, in 1974, stated that it is the fibre longer than five microns which is dangerous. (16)

Webster, in 1970, mentioned that fibres of crocidolite asbestos, shorter than five microns were proven to be non-fibrogenic. (17)

Hilscher and others, in 1968, had concluded similarly, but not only with short fibres of crocidolite, but also with short fibres of chrysotile. (18)

Davis and Gross, at the Lyon Conference, stated that quantities as high as 24 milligrams of short chrysotile fibres injected through the trachea demonstrated that not only was this important quantity of asbestos well tolerated by the animal but also that the tissulary response was only a macrophagic reaction with no significant proliferation of stroma, that is to say, with no formation of fibrosis. They had compared these results with experiments made with intra-tracheal injections of long fibres of asbestos but in quantities no higher than two milligrams which had produced an important tissulary fibrosis. (19)

At the Rouen Conference, in October 1975, Professor Beck of Germany said that there seemed to be a cause-effect relation between the fibrogenic and carcinogenic actions of inorganic dusts and their physical parameters, that is to say their length and diameter, whatever their chemical composition. He added that such carcinogenic or fibrogenic action was limited by a minimum length and a maximum diameter. (20)

Pott and Dolgner, at the same Rouen Conference, reported that various fibrous and granular dusts were injected intro-peritoneally to rats. All types of asbestos and extremely thin glass fibres used for the experiment produced tumors. The results showed that the carcinogenic action of asbestos is surely related to its fibrous configuration; they added that the dose-effect relationship of fibrous dusts depends on the number, diameter and length of fibres and on the period of time they remain in the body. (21)

Professor Robock also indicated that the importance of the physical characteristics of the fibres which can be

inhaled all the way to the alveolar region is well defined for the cytopathogenic, fibrogenic and carcinogenic action. The aerodynamic quality of the fibres, which depends on their diameter, is of crucial importance in the alveolar deposition. (22)

Data gathered in recent studies, however, point also to the importance of surface chemical characteristics.

Finally statistics show that the presence of cigarette smoking is necessary to explain the high occurrence of lung cancer among persons exposed to asbestos.

4. RESEARCH IN QUEBEC

Results of the most comprehensive scientific study on the effects of asbestos dust exposure

The dose-response relationship is clearly demonstrated in the most recent comprehensive scientific study on the effects of asbestos dust.

A) 14 years of research

The results of a fourteen-year epidemiological study on a group of asbestos workers show among other things that the risk of lung cancer among asbestos workers who are continuously exposed in the workplace to 1 mpcf is equivalent to the risk involved in smoking less than one cigarette a day. (1 mpcf is equivalent to 1 to 7 fibres/ml).

This important scientific research project was carried out under the direction of Professor J.C. McDonald, Director of the Trade Union Congress Centenary Institute of Occupational Health at the London School of Hygiene and Tropical Medicine, assisted by his wife, Alison McDonald, Professor of Epidemiology at St. Mary's Hospital Medical School, by Douglas Liddell, Professor of Medical Statistics at McGill University, by Graham Gibbs, Director of the Institute of Occupational Health and Safety of McGill University, and by Gail Eyssen who is currently working in cancer epidemiology at the University of Toronto.

The research was part of a program established in 1966 at McGill University, at the invitation of the Canadian Government and with encouragement from the Government of Québec, to study the health effects of work in the asbestos industry.

The entire asbestos industry of Québec contributed to the study, from company management and unions to workers and their families. In addition to government backing, McGill University and the London School of Hygiene and Tropical Medicine, the joint organizers of the project, received financial support from the Institute of Occupational and

Environmental Health of Montréal.

The results of the first three years' work, which included the reading of 16,000 chest radiographs, comprehensive tests on a sample of workers and studies of mortality to the end of 1969, were summarized by Dr. J.C. McDonald and his colleagues in 1974.

The final report - published in the British Journal of Industrial Medicine - goes into greater depth on the issue of asbestos dust exposure than any other epidemiological survey yet carried out. Moreover Professor J.C. McDonald considers that he has made the optimum possible use of the data currently available on the subject. It must also be stressed that the international scientific community has acknowledged the value of this study, conferring upon it a degree of credibility that makes it a key work and reference document.

B) Objectives and methodology

The survey's primary aim was to define as accurately as possible the quantitative relationship between exposure to chrysotile asbestos fibre and the incidence of lung cancer.

Since lung cancer is also associated with smoking, a second objective was to attempt to separate the hazards and to determine the importance of each factor in the cause of mortality.

Additional aims of the survey were to measure the exposure-response relations for other diseases including cancers

of the gastrointestinal tract and larynx, and for pneumoconiosis and other respiratory diseases.

~~The members of the sample group were chosen according to the following criteria: being born between 1891 and 1920 and having been employed for at least one month in the asbestos industry.~~ These criteria ensured the widest possible range of levels of exposure and of duration of employment. Considerable effort was deployed to trace every person in the sample. For those who had died, once copies of the death certificates had been obtained, the causes of mortality were coded according to the International Classification of Diseases.

After checks and more stringent application of the criteria for admission to the group, the study sample was reduced from the original 11,788 to 11,379 (10,939 men and 440 women).

A great deal of work went into determining the level of dust exposure for each subject, according to norms set by Drs Gibbs and Lachance. This was particularly difficult for the years prior to 1949 when there had been few measurements. Drs Gibbs and Lachance obtained their assessment of dust levels prior to 1949 by means of interviews with long-service employees and comparisons with more recent conditions.

Thus for each person the survey established the period of exposure per employment and the total of annual dust exposures (accumulated exposure); for almost all subjects it also determined smoking histories, and distinguished the following categories: non-smoker, moderate smoker or heavy smoker, the latter indicating a consumption of 26 to 50 cigarettes per day. The information was obtained by means of a questionnaire

answered by the subjects themselves or by their friends or relatives.

C) Exposure and smoking

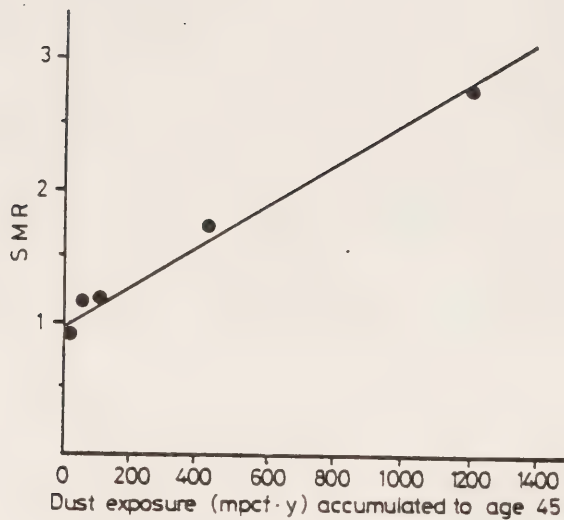
For each category of smoker the risk of lung cancer increases with the level of exposure, thus strengthening the argument that for lung cancer the dose-response relation is linear (see table). The effect of smoking is particularly harmful with heavy smokers whose standardized mortality ratio (*) is 4 times higher than that of non-smokers at the highest exposure level (see table).

In recent years, after a number of shorter research projects, less comprehensive than the present one, the industry had already seen fit to make workers aware of the dangers involved in smoking associated with exposure to asbestos. Not only do the published results justify such action, they may also give rise to restrictive legislation on smoking in the workplace.

The fact that the dose-response relation for dust exposure and lung cancer is linear is of major importance for the determining of acceptable risk.

There are obviously a great many factors which can influence a study of this kind: the risk of error exists, and every criticism must be closely examined. But the fact remains that this study is as solid and valid as the figures on which it is based.

* SMR: Standardized Mortality Ratio, i.e. the ratio between the actual mortality rate of the study sample and the expected mortality rate, the latter being based on the actual mortality rate of the population as a whole.



This graph showing the relation between the standardized mortality ratio due to lung cancer and accumulated dust exposure to age 45 has been weighted using a graphical computation technique. The horizontal line represents accumulated dust exposure to age 45 in millions of fibres per cubic foot/year; the vertical line represents the standardized mortality ratio due to lung cancer.

Deaths from lung cancer in relation to dust exposure and smoking habit								
Smoking habit	Accumulated dust exposure to age 45 in millions of fibres per cubic foot/year.							
	Less than 30		From 30 to 300		more than 300		total	
	Deaths	SMR ⁽²⁾	Deaths	SMR	Deaths	SMR	Deaths	SMR
Non-smoker	5	0.18	6	0.36	8	1.24	19	0.38
Moderate smoker	73	1.14	64	1.35	52	2.31	189	1.41
Heavy smoker	13	2.12	11	2.39	10	4.50	34	2.63
All smoking habits	91	0.93	81	1.18	70	2.25	242	1.23

Some doubts have been expressed as to the value of the reaction established between exposure and smoking. The data in this survey do not invalidate the argument that asbestos exposure in itself increases the risk of cancer even for non-smokers. But they do confirm the results of several other research projects which conclude that smoking increases, and even multiplies, the risk of lung cancer.

D) Quantification

According to Dr. J.C. McDonald's report, the risk run by asbestos workers before the implementation of dust controls in the mines and mills, i.e. in conditions which no longer exist, was equivalent to that involved in smoking heavily "whereas, at more recent concentrations of around 1 mpcf the order or risk may now approximate to less than one cigarette a day".

The establishing of the relation between risk in the workplace, considered to be "imposed", and the risk of smoking, considered to be a "free choice", should shed new light on the issue of acceptable risk which the industry may ask a man to accept in view of the benefits which it provides.

This study was conducted without a break for fourteen years and aimed to determine the quantitative relations between mortality and workplace exposure in the Québec chrysotile asbestos industry. The analytical methods used were varied and precise; the results obtained remained constant. It may be assumed that the purpose of the study was achieved.

By using these environment quality measurements, the mortality risk associated with work at different dust levels can now be assessed with some confidence. The precision of this risk assessment should now make it possible to determine an acceptable dust level and to take the appropriate social and political decisions.

E) Findings

One of the findings of the study shows that there is an evident dose-response relationship in the cases of asbestosis and lung cancer, less evident in the cases of the cancer of colon and rectum, respiratory tuberculosis and other respiratory diseases.

Here the authors emphasize the importance of having examined subjects exposed to a wide range of dust concentrations in order to determine the increase in risk with the increase in exposure. In fact, even using a sample of workers who were exposed continuously over a period of 20 years to 20 f/cc, it would have been difficult to establish an increase in risk. ??

Thus it would seem that, if it is almost impossible to discern an increase in risk at an exposure rate of 20 f/cc, a level which has not been found for many years, it is all the more so at 2 f/cc, i.e. at the present standard for dust levels in the asbestos industry.

5. HEALTH CONDITIONS IN MINES AND FACTORIES

The environment in mines is totally different from that of other places where asbestos workers operate such as manufacturing plants, insulation work, etc.

In the environment of asbestos containing products manufacturing and of insulation work, there are many co-factors which cannot be found in a chrysotile asbestos processing plant. Let us include here part of the conclusions of a report of Drs. J.C. and A. McDonald:

"At the IARC Conference on the Biological Effects of Asbestos held in Lyon in 1972 our findings in the Quebec mines and mills were reviewed with those from other areas of chrysotile production in the USSR, Italy, Cyprus, South Africa and Rhodesia (9, 10). Though somewhat scanty, such data as was available was reasonably consistent with our own. At least for asbestosis and lung cancer, it seems clear that there is a direct relationship with length and level of exposure. Despite the poor correlations mentioned, which suggest that there are other factors than dust to be taken into account, we conclude that the risk of clinical manifestation of these two diseases can be reduced to an acceptable level."

For example, in the atmosphere of an asbestos-cement pipes factory, co-factors like particles of silicium coming from the cement and a fraction of crocidolite asbestos (amphibole) can be found.

The insulation worker operates in various environments, but in all of these you find a considerable amount of co-factors such as silicium, various gaz emanations and other substances, often carcinogenic, which explains the epidemiological studies which have shown that the type of exposure to which the insulation worker is subject makes him fifteen times more susceptible to health problems than the worker of a chrysotile asbestos plant.

For information only, hereafter is a summary of products with which an insulation or a factory worker come into contact:

- Gypsum dust
- Fiberglass
- Toluene
- Kaolin
- Talc dust
- Cement dust
- Silicium
- Toxic fumes
- Tar
- Sulphurous oxide
- Bentonite, etc.

Unfortunately, very few studies are actually being made on the co-factors. However, it was possible to show experimentally that chrysotile asbestos injected in the trachea of the animal did not produce any tumor whereas when benzopyrene was added to chrysotile asbestos, numerous tumors and much larger tumors appeared, than with only benzopyrene which is by itself a carcinogenic factor. Also as mentioned before, Dr. Selikoff's studies have shown that cigarette is a very important co-factor. (23)

All the substances hereabove mentioned, used in association with chrysotile, probably act as co-carcinogens and probably explain the numerous cancer cases among factory, insulation and other workers.

6. ASBESTOS IN PUBLIC BUILDINGS

Reducing the mortality and morbidity of cancer has become an important regulatory problem. To date, approximately 26 chemicals have been shown to be carcinogenic in man. Many other chemicals have shown mutagenic and carcinogenic potential in animals and are considered to be possible human carcinogens. Most of these chemicals either cannot be entirely removed from the environment or can be removed only at enormous expense⁽²⁴⁾.

Quantitative risk assessment is defined as the estimation of levels of exposure to a toxic substance which lead to specified increases in lifetime incidence rates or in probable occurrence of a given undesirable consequence⁽²⁴⁾.

Asbestos fibre did not fail to be in this group of toxic substances for which quantitative risk assessment is proposed, first in the industry and now, with increasing scientific hysteria crisis, in the general public. Every recently built school, office, governmental building, etc. seems to prompt a new illuminated specialist who, after learning that the building has been isolated with asbestos containing material, decides to claim publicly in the newspaper or other news media that the general population, children, pregnant women, etc. are

at high risk when entering such building. Except in rare cases, the monitoring reveals exposure levels at less than 0.04f/cc or a BDL exposure i.e. below detectable level exposure. Nevertheless, there is always someone, for political reasons, or personal interest, who requires the removing of asbestos insulation or containing material. May we quote here the summary of a study report prepared by James T. Schirripa:

"Cancer risk from asbestos materials installed in
"general occupancy" buildings is so small that it
is almost "negligible" a five-year study released
by an industrial hygienist concluded.

Prepared by James T. Schirripa, president of Industrial Hygienics, Huntington, N.Y., the study concluded that the "seriousness and magnitude of the cancer risk of asbestos in building materials and insulation has been overstated and, in fact, is minimal in most cases". It also found that removing the asbestos materials "can actually increase the very hazard it sets out to diminish".

Schirripa's report, presented at the 1980 American Industrial Hygiene Conference held in Houston, Texas, May 22, was based on a five-year study of 100 general occupancy buildings, including schools, churches, offices, ships in port, libraries, and industrial plants. In each of the environments, the source of asbestos fibers was insulating material sprayed on for fire proofing or used on piping.

"In essence", Shirripa explained, "we took air samples in environments with asbestos installations to measure the concentration of fibers; and then calculated the amount of time it would take to develop a tumor after exposure to the determined concentration". The "time-to-tumor" equations, Schirripa said, have been used by federal agencies in their standardization activities. The Consumer Product Safety Commission, he noted, used this method in banning asbestos wall patching materials.

The results of the study indicated that the general level of asbestos in the air of those buildings was 0.10 of a fiber per cubic centimeter or lower, presenting in Schirripa's view a "very, very small, if not negligible" risk of cancer. In building showing the highest asbestos level, the rate of potential cancers due to continuous exposure would be 112 cases per million in the population over 40 years, or 2,707 cases in 74 years. In practical terms, the report said, the time to tumor exceeds the life span of all persons exposed.

But, according to the study, the risk of cancer from asbestos fibers may increase significantly in the process of removing the asbestos materials. Schirripa found that the "risk of doing something (removing asbestos insulation) increases the rate of potential cancer cases from 112 cases per million in the population over 40 years, to 2,245 cases per million in 40 years, or 12,349 cases in 75 years".

But no matter how minimal, the risk of cancer posed by asbestos fibers should, and given today's technology, can be eliminated by the use of substitutes, the report concluded. Since 1970, it said, many new substitutes for asbestos in insulation have been found and these substitutes should be used to prevent any potential hazard." (25)

Regarding asbestos, there is no zero-level or zero exposure on earth. Asbestos is a natural product occurring in small quantity in the earth crust, the latter composed of the same chemical elements; only the crystallization process has been different for asbestos fibres. The air which the human body inhales normally contains at least 0.001f/cc i.e. inhales about 4,480 fibres per day. An asbestos worker inhales 1.5 million fibres per working day. An out-of-breath jogger, downtown Toronto, may inhale as many as 1.3 million fibres while exercising.

Consequently, our lungs are exposed to millions of asbestos fibres during life, no matter if we are exposed to natural or artificial asbestos sources.

A special Commission created to analyse asbestos exposure in Massachusetts public schools developed its own guidelines, since there are no public exposure standards for asbestos. Based on air sampling data collected at nine schools containing no asbestos, the Commission appointed Ad Hoc Committee established that interpretation of air levels at or below 0.04 fibres per cc was not possible due to normal background noise. Airborne fibre concentrations in excess of this value were considered of significance⁽²⁶⁾. Hence, a 0.04 f/cc exposure is a background dose.

In his presentation made at the second public meeting of the Royal Commission, Dr. E.J. Chatfield clearly stated that all the samples taken in the Ontario public schools were below 0.04f/cc.

The question is: "Is there any risk of impairment to the health of children in general at such level?"

When one speaks about health risk, one thinks immediately in terms of disease. But it depends if we have a clinical concept or an epidemiological concept of a disease. This is extremely important, because the majority of study reports quoted in the news media regarding diseases related to chemical, physical or mineral products are written with an epidemiological concept, while the reader and very often the journalist have a clinical concept of the disease. We would like to quote here Professor Margaret Becklake of McGill University who wrote in *Le Médecin du Québec*, November 1980:

"En général, le concept clinique d'une maladie suppose que le processus est assez avancé pour constater des perturbations de la morphologie ou de la fonction avec des manifestations perçues par le malade (symptômes) ainsi que par le médecin (des signes cliniques ou des anomalies dans les tests de laboratoire); de plus, ces perturbations sont souvent accompagnées d'une incapacité. L'objectif du diagnostic est de développer un plan d'action pour l'individu.

Par contre, en ce qui concerne le concept épidémiologique, on peut utiliser des indices de "malajustement ou de défaillance des mécanismes d'adaptation" (soit des anomalies minimales et précoces sans aucune manifestation clinique) comme mesures de réponse et comme indices des effets potentiellement nocifs. L'objectif de l'approche épidémiologique est d'évaluer l'état de santé non pas d'un individu, mais de la population dont cet individu fait partie." (27)

One must realize that very often in epidemiological study, particularly with asbestos epidemiological studies, authors refer to abnormalities without clinical manifestations and we have already shown before that even at a level of 20f/cc it would have been difficult to establish an increase in risk. So, what is the risk at 2f/cc? What is the risk at 1f/cc? What is the risk at 0.1f/cc (Shirripa's study)? What is the risk at 0.04f/cc? Clearly, there is no risk at such level.

7. HYPOTHESES

Caution should be exercised by the members of the Royal Commission on Asbestos against the tendency of certain persons in the general public, in the media and even in certain scientific circles to accept as truth statements that are strictly hypotheses.

A) The extrapolation problem

One of the pitfalls of the argumentation against asbestos is the technique of extrapolation used to pretend that the zero-increase of risk would correspond to a zero level of exposure. This extrapolation technique is purely mathematical and does not correspond to the biological reality. Extrapolation results are used as proven truth, while it is only a mathematical hypothesis. Mathematics are abstract constructions while biology is a concrete science. One simply discounts the human biology reality by treating illnesses instead of treating people and does not discuss the normal defence of human cells. This purely mathematical hypothesis seems more likely to be against the basic biological reality one experiences every day. The presentation of Dr. David Muir at the second public meeting of the Royal Commission on December 12, 1980, confirmed the fact that extrapolation is a pure mathematical hypothesis and should be used as such. Dr. John Van Ryzin, Ph.D., from Columbia University, School of Public Health in New York, declared at the 1979 Annual Meeting of the American Academy of Occupational Medicine speaking about quantitative risk assessment, as follows:

"Issues in Low-Dose Extrapolation"

The three examples given previously illustrate the variety of answers one can obtain from low-dose extrapolations by various models. The answers are highly model-dependent and there are questions regarding their validity. Some argue that low-dose

linearity is to be expected for all carcinogens because of dose-wise additivity of a postulated background "effective" dose and the administered dose. Their argument rests heavily on the dose-wise additivity assumption and a formal mathematical argument using a Taylor series expansion around a linear term with the assumption that the dose-response curve has a strictly positive slope at the postulated background effective dose level.

Unfortunately the assumptions of dose-wise additivity, an effective background dose and the point that the dose-response curve has a strictly positive slope for all $d > 0$ and all carcinogenic dose-response curves are far from being biologically verified facts. If DNA repair mechanisms are at work, the slope of the dose-response curve may be zero to some point d^* above the postulated background dose. If dose-wise additivity with the background dose does not hold throughout the dose-range, low-dose linearity may not result." (24)

We strongly recommend to the members of the Commission to carefully peruse this report by John Van Ryzin.

There is a level for noise where the ear suffers no damage. There is a level for toxic substances where there is no toxic effect on the human being. A little bit of wine can be good, too much is bad for the human liver, and so on. But for some people, when they speak of a "carcinogenic substance", they hypothetically assume that the human biological cell stops reacting.

B) The definition of a potential occupational carcinogen

This is an other assumption that should be strongly attacked. OSHA based its definition of a carcinogenic substance on two hypotheses that are highly questionable. The first one is the use of animal tests for labelling substances dangerous to men. While animal data have been shown to overestimate human risk from carcinogens, the agency continues to rely solely on animal data⁽²⁸⁾. The OSHA cancer policy establishes two categories of potential occupational carcinogens depending on human epidemiological studies and/or experimental carcinogenesis bioassays in mammals, with positive results in short-term tests to be used as concordant or "suggestive" evidence. Here, once again, OSHA is discounting the human biological reality. It has been known for a long time that there are specific diseases for different species of mammals. But when referring to cancer, it allows itself to transfer the result of a single mammalian species to an other species, making no difference whether the introduction of the so-called carcinogenic substance in the mammalian animal was non-natural or extremely high dosages were used.

The other hypothesis in this definition is the use of the "Res ipsa loquitur" theory. One pretends that if a substance is carcinogenic, one molecule of this substance is carcinogenic. This is also a pure hypothesis. One forgets that a substance is not carcinogenic by itself, but always in relation to a biological cell and, as already mentioned, discounts the normal defence of the human cell for instance DNA repair mechanisms⁽²⁴⁾. It is certainly as good an hypothesis, and closer to the biological reality, to pretend that a substance could be carcinogenic in regard to the human cell at a certain level, but is no more a carcinogen at a lower one.

8. THE ACCEPTABLE RISK

~~The opponents to asbestos do not accept the theory of the acceptable risk and pretend to the possibility of a zero risk policy. In every human activity, there is a risk.~~ No scientific or technological activity can be completely free from risk. If we want to be able to use electricity, take drugs when we are ill, and travel by car or plane, then people are going to die and be injured as a result. Though risks cannot be totally eradicated, they can be measured, investigated, evaluated, controlled, and reduced⁽²⁹⁾. When a government decides to accept a speed limit of 90 km per hour on the road, at the same time it accepts that there will be a certain amount of deaths and a certain amount of injuries that can be easily calculated. If a government announces the construction of a tunnel somewhere, it may indicate, beforehand, the expected cost of this tunnel and the expected deaths that will occur during the construction. When the government announced a major venture, it can inform the population as to the expected cost of the project and the number of years it will take to build it, but it could as well inform the population as to the "expected deaths" that may occur until the completion of the project.

~~The acceptable risk is directly related to the cost benefit analysis of a problem.~~ The cost-benefit analysis is as good an instrument as the epidemiology science can be. Quite often, some people do not understand the objective of a cost-benefit analysis. They think that it is a cruel way of evaluating a situation. They pretend that one is evaluating the price of life in terms of money. On the contrary, the purpose of such research is to evaluate the benefit for the whole society, including the asbestos workers, compared to

the cost one has to pay for those benefits. If the final evaluation in terms of life is diseases or deaths for the asbestos workers, then the risk is one that is not acceptable. But it is proven that even with 20 fibres/cc, it would have been difficult to establish an increasing risk; so, what is the risk at 2 fibres/cc? It is clear that a level of 2 fibres/cc, or less, is adequate to prevent any detectable increase in incidence of asbestos-related disease for the workers and so much more for the general population.

Political decisions should be supported by sound epidemiological research, true cost-benefit analysis and real assessment of acceptable risk. Theories based on unproven hypothesis cannot be the fundamentals of a political decision.

MODERN OPERATING TECHNOLOGY AND MEASUREMENT
OF ASBESTOS DUST LEVEL IN QUEBEC ASBESTOS
MINES

The Quebec Asbestos Mining Association is pleased to cooperate with the Royal Commission in its study on matters of health and safety arising from the use of asbestos in Ontario. Our Association realizes that the conclusions of this study will help to reestablish the highly exaggerated poor reputation of the valuable asbestos mineral as produced and processed in 1980 versus the conditions which existed prior to the 1960 period when the health hazards related to excessive asbestos dust over long periods were not scientifically known, when adequate dust control equipment was not available in the market and when dust measurement equipment was not adequate.

Our Association hopes that your Commission will follow and possibly update the formulation of the recommendations of the Beaudry Commission report published in 1976 concerning:

- a) modern exposure of asbestos workers;
- b) modern health conditions of these workers;
- c) adequate dust measurement equipment;
- d) influence and control of additives used in asbestos manufacturing plants.

As a preliminary approach to their broad investigation, it would be advisable, in our opinion, that the members of

the Ontario Royal Commission pay a visit to the modern Quebec primary asbestos plants where the most up-to-date equipment and production techniques have been developed and put into operation; this visit should also include their evaluation of existing local medical clinics.

Our presence before your Commission is justified by the fact that, as Canadians it is our duty to defend one of the ten most important minerals produced and processed in Canada by thousands of Canadians. Expressed in dollar value of canadian mineral production, asbestos ranks at the same level as uranium and potash.

In general, the existing criticism of asbestos in relation with health is related to the period preceding the year 1960. It is only at that time that exposure to excessive asbestos dust over a long period of time started to become scientifically and medically established as a health hazard. One must also realize that, prior to 1960, adequate protective equipment was not available both in quality and quantity.

In the last two decades, major improvements have been made in the asbestos industry and, at present, the most sophisticated equipment used in modern plants, the efficient training of operators and the cooperation of labor unions has not made it possible to attain a time weighted average of one fibre per cubic centimeter. On the other hand, recent scientific epidemiological surveys and medical reports have shown that, with a dust concentration averaging 2 fibres per cc, the health of workers is well protected.

It is astonishing that the Ontario Ministry of Labour has gone ahead with proposed changes in asbestos regulations when the Government of Ontario has just taken the Royal Commission route with a mandate to study all aspects of asbestos in Ontario.

The Beaudry Commission report, published in 1976, submitted an up-to-date presentation of asbestos and health problems and made firm recommendations on environmental control of asbestos dust, on instrumentation to be used for spot control, geographic surveys, continuous monitoring, dynamic personnel sampling and high volume sampling. Fiber counts and gravimetric measures were covered in full details and rigid norms and threshold limits were recommended to the Quebec Government and promptly accepted and enforced by the Department of Natural Resources.

During the period 1970-1980 inclusive, more than one hundred million dollars have been invested in environmental control within the primary Quebec asbestos industry. To date all equipment has been enclosed and operated under vacuum and the percentage of exhaust air used exclusively for dust control has been raised to more than 40% of the total (Appendix 1). In modern plants, bagging, sewing, sealing, palletizing, storing, regrading, shipping and dry rock storage operations have been fully mechanized and automated and all employees have been trained in proper handling of asbestos. High capacity water tanks have been added to control dust on mine roads and platforms; in heavy equipment air conditioning units have been installed in the cabins; bag filter units have been added to cyclone collectors at all remote ore and waste mechanical

transportation and transfer points; high capacity central vacuum systems have replaced brooms for cleaning floors and equipment; jute bags have been eliminated and replaced by dust proof paper and plastic bags; standard clean maintenance procedures have been developed for mill equipment.

Weekly, semi-annual personnel-dynamic and spot surveys are carried out on a regular basis using both fibre counts and gravimetric measurements. High volume air sampling is also read daily at stations located around the periphery of the property. Union and company technicians work in parallel during all these surveys and the results are passed on to both the Department of Natural Resources and the President of the union. These data are also reported to all the employees through the monthly union letter to membership. Despite all these procedures and efforts, after 5 years, it has been impossible to reduce the dust concentration below 1.5 to 2.0 fibres per cc on a time-weighted average basis (Appendix 2). Annual medical examinations, verified by the Department of Pneumology of the Government, show that all employees hired during the last two decades enjoy a health status at least equal to that of the general population.

The proposed Ontario Ministry of Labour regulation states that "the time-weighted average exposure to chrysotile must not exceed 1.0 fibre per cc of air". There is no scientific technical nor medical evidence which supports this rigid requirement. On the contrary, the 1980 report of J.C. McDonald et al published in the British Journal of Industrial Medicine 1980: 37; 11-24, concluded that a cohort

~~of workers exposed continually to 20 fibres/cc over a period of 20 years does not indicate a risk higher than the general population for lung cancer.~~ This exposure of 20 f/cc is considerably higher than the present standard of 2 fibres/cc. It must be noted that the McDonald report covers a cohort of 11,379 workers. This report also shows that smoking of very few cigarettes a week is more harmful to health than the present exposure to asbestos dust.

Confirming the McDonald report, in one of the primary plants built in 1957, the most important and, at the same time, the most impressive finding is the health condition of the employees having worked during the last two decades when the dust concentration was gradually reduced from approximately 20 fibres per cc to the present 2 fibres per cc. Among the 740 workers, a group of 350 men who had no previous exposure to asbestos dust and who have individually accumulated a continuous service of 23 years in the plant do not show any indication of respiratory disease related to asbestos dust. This record suggests that, with adequate control, for example a concentration of 2 fibres per cc, the asbestos worker is not at a greater risk than the general population.

Considering the asbestos health issue, one has to be careful not to act as "modern archeologists dreaming in the past" but to accept scientific evidence that a weighted average concentration of 2 fibres per cc does not present any excess risk to asbestos workers.

The Northern section of the Province of Ontario, in the Timmins area, includes a favorable geological formation which, one day, could contribute to an economic production of chrysotile asbestos. It would be advisable for the promoters of such deposits to benefit from the experience gained in primary asbestos plants in other provinces of Canada and in other countries of the world.

Members of the Commission should evaluate the results of other modern asbestos mills before recommending a time-weighted average dust concentration which would be impossible to attain even with the most modern equipment. To legislate down to 1 fpcc would be equivalent to banning the mining of asbestos in Ontario.

Asbestos recommendations in other countries (Appendix 3) present a summary of the main features of asbestos/health regulations in many countries of the world.

One should note that only countries which are major producers of possible substitutes have a TWA regulation below 2 fibres/cc.

In the list of issues before the Royal Commission on asbestos, one (Issue No. V) covers the respective responsibilities of employees, labour unions and government agencies in dealing with the asbestos health problem and the success attained by each group.

In the Province of Québec, during recent years, the actions and accomplishment of the different groups can be summarized as follows:

A) The employers have made major effort in improving the quality of the ambient air by investing one hundred million dollars to provide additional exhaust air, by completing the covering of existing equipment, by installing the most sophisticated automated equipment, by providing central twin vacuum systems to replace the former broom cleaning method. The employers have also made a major effort in training union-selected representatives as hygienist-technicians to work in parallel with company technicians in measuring the dust content of the ambient air and in evaluating the results of these measurements; the union representatives have also followed courses in ventilation and noise control.

B) The labour unions have cooperated efficiently with the companies in taking full advantage of the provided training and in advising the workers and the union officers of the results; they have also been effective in training workers on the proper use and maintenance of the equipment.

The labour unions, specially the steel workers of America, have also been extremely useful in defending the reputation of asbestos by delegating some of their top executives in Europe to, at least three meetings of the International Labour Organization and the International Federation of Metallurgical Workers, where they were successful in convincing these organizations that with proper handling, asbestos can be used

safely without affecting the health of workers and that the proposed suggestion of banning asbestos be rejected.

C) The government agencies, as demonstrated by the Beaudry Commission, have been successful in recommending proper handling of asbestos, in suggesting the most efficient measurement equipment and in recommending to the Quebec Government a norm which can, at the same time, be technically possible with the proper use of modern equipment and also protect the health of workers.

Results of this cooperation between employers, labour unions and government agencies are well illustrated in Appendix 4.

Measurement of asbestos levels in the ambient air

A worldwide survey of the regulations concerning asbestos and health (Appendix 3) shows that most countries have adopted the basic NIOSH Membrane Filter Method with appreciable variations in the instrumentation itself and in the techniques used by the different laboratories in evaluating the results; these variations range between 30% and 50% in the case of experienced readers and 100% in the case of inexperienced technicians (Appendix 5).

Another important country, Russia, is using the gravimetric method while Germany, Austria and the Province of Québec have based their regulations on a combination of membrane filter and gravimetric techniques. The Association believes that the regulation used in the Province of Québec, combining efficiently the two methods, should be evaluated seriously by the Ontario Royal Commission.

At the present time, a committee of experts selected by the Asbestos International Association is working seriously on the presentation of a standard measurement method which could be used throughout the world as an official standard.

NIOSH membrane filter method (Appendix 6 and 7)

This method of sampling, mounting and counting fibres is used both for strategies of fixed station sampling, dynamic sampling and for personnel sampling. This apparatus permits only an index value of the real concentration of asbestos fibre in the ambient air. The index concentration is based on the measurement, using a phase-contrast microscope under magnification of 400 to 450 of particules with a 3:1 length-diameter aspect ratio which are longer than 5 microns, where the diameter is limited by the respirability of the fibre at one end (3.0 microns) and by the resolution of the microscope used at the other end (± 0.5 micron).

The membrane filter method lacks uniformity from country to country and also from laboratory to laboratory. The diameter of the filter varies (37 mm, 25 mm and 13 mm); the net opening of the filter varies between 0.8 micron and 1.2 microns. The type of graticule used on the microscope varies from the Ponton (factor 142.5), the Waltan and Beckett (factor 54.45), the german graticule, the BS 3625 and the Patterson. The volume of air per minute and the period of sampling in minutes also vary from country to country.

These variations make it compelling that a uniform method presently being prepared by the Asbestos International Association be adopted on a worldwide basis.

Gravimetric measurements

| APM (Appendices 6 and 9)
| RDM-101-4 (Appendices 6 and 8)
| FAM (Appendix 6)
| Tyndallometer (Appendix 6)

These gravimetric measurement methods are described in detail in Appendices 6, 8 and 9.

The APM (ambient pollution monitor) (Appendix 9) detects the particulate concentration by the beta radiation attenuation principle. It is normally used as a continuous dust monitor.

The RDM-101-4 (respirable dust monitor) (Appendix 8) collects respirable dust at a rate of 2 liters per minute by impaction on a polyester disc on which a layer of grease has been spread; the non-respirable fraction of the dust is separated by a 10 mm nylon cyclone. This cyclone stops all particules with an aerodynamic diameter less than 2 microns. The measurement of the concentration is performed automatically with the beta radiation attenuation principle. This instrument can be run on the automatic mode for concentration of 0.02 to 50.0 MG/CU meter. The measuring cycle is 4 minutes. It is used for measurement at fixed stations as well as for dynamic surveys.

The FAM (fibrous aerosol monitor) (Appendix 6) is the only instrument now available on the market that monitors the concentration of fibres numerically. It may, when it is fully tested and accepted, replace the membrane filter method in some of its applications. This instrument is fully described in Appendix 6.

The Tyndallometer (Appendix 6) puts into application the "Tyndall Effect" whenever microscopic particules, that have dimensions comparable to the wave length of light, are present in a transparent environment. Their presence is not detected by transmission, as they do not produce a shadow, but by laterally diffracted light; this phenomenon is called diffusion of light.

The Tyndallometer is designed so that the signal measured is proportional to the volume of dust deposited in the lungs; the signal is then converted to gravimetric term (milligrams per cubic meter).

The Tyndallometer is used as a spot checking instrument to give valuable information on the variations of dust concentration.

Dust Masks (Appendix 10).

In 1973, McGill University made a scientific study and evaluation of the 13 most popular dust masks and it concluded that the single-wear-use 3M-8710 was the most efficient respirator for dust concentration varying between 5 fibres/cc and 50 fibres/cc. This type of mask is presently in use by all Québec asbestos primary plants. It has the advantage of being efficient, light, comfortable for the worker and it is well accepted by all the operators.

ASBESTOS PRODUCTS

Asbestos fibres are used in the manufacturing of some 3 000 products which fall into five main categories: asbestos-cement, which is a leading application, papers and felts, textiles, friction materials and additives.

Asbestos-cement products account for more than one half of all asbestos applications. This material can be put to use in the manufacture of an incredibly broad range of products whose basic properties are the same, but which offer a variety of styles, shapes and colours.

Fibrocement is especially well suited to the manufacture of irrigation, water distribution and sewage pipes, as well as acoustic tile, shingles, window panels and flat and corrugated panels. Besides, like most asbestos products, it is perfectly safe, since the asbestos fibre is completely sealed in the mix. As a matter of fact, as recently as November 1980, the Environment Protection Agency (EPA) has ruled that asbestos-cement pipe in water supply systems was less dangerous to health than polyvinylchloride (PVC) and other plastic pipes.

Today, asbestos-cement is used, in all styles and types of buildings, whenever durability and safety must be assured. The success of asbestos-cement is not only due to its properties,

but also to the fact that no other product offers the same advantages. Thanks to the asbestos-cement products, for instance, hundreds of lives have been saved in the case of fires in private homes as well as in public buildings.

Asbestos is also an ideal friction material both for brake and clutch facings. No substitute brake lining material can provide the same cost/quality advantage as asbestos. Besides its high friction level, thermal dispersion, stability and reinforcing properties, asbestos costs less than any possible substitute. Tests also show that its use in brake and clutch linings is perfectly safe, since the asbestos is retained in the lining's baked resin, which reduces dust emission to almost nil. Because of the very high temperatures generated during the normal wear of brake lining, most of the chrysotile is converted to an inert and amorphous mineral called "forsterite" and only a very small fraction (0.3%) of the asbestos present in the brake lining escapes to the atmosphere.

Asbestos is without doubt foremost among the products which contribute to the progress and development of the modern world. Thanks to its exceptional properties, which no other natural or man-made substance can duplicate, it furthers the well-being, safety and protection of man.

CONCLUSIONS

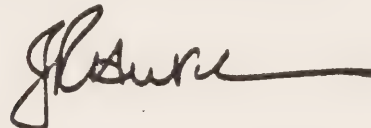
Public discussion of the health implications of exposure to asbestos dust has led to the unwarranted and erroneous assumption that data on health risks associated with occupational exposure in the past are applicable at present time to the general public and to many locations where asbestos products can be handled with complete safety. It is well known that in many asbestos products the fibre is "locked-in" by another material. In asbestos-cement sheet, for example, it is locked-in" by cement; in brake and clutch linings by a fully baked resin; in gaskets by rubber or synthetic rubber. So, many modern asbestos products are not by their nature dusty to handle.

There is little evidence, scientific or otherwise, that anyone in the general public has contracted any disease as a direct result of using asbestos products in their homes or from exposure to the very small amounts of asbestos released into the atmosphere through the application, use, wearing or weathering of finished asbestos products.

Asbestos-related diseases develop, generally, only after the inhalation of abnormal quantities of airborne asbestos dust. Concentrations of this order have not been

found in the general urban atmosphere, and the general public are not at risk on this account. A more severe standard should be set, only if justified by new scientific and medical data.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "G. L. Laroche", with a long horizontal stroke extending to the right.

Quebec Asbestos Mining Association

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A N N E X

T A B L E O F A P P E N D I C E S

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Graphics: - concasseur
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10. "3M" No. 8710 Respirator
Scientific study and evaluation carried out by McGill
University.
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N.B.: The annex of appendices is available at the office
of the Chairman of the Ontario Royal Commission.

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SUBMISSION
TO THE
ROYAL COMMISSION ON MATTERS OF HEALTH AND SAFETY
ARISING FROM THE USE OF ASBESTOS IN ONTARIO

BY THE
CONSUMERS' ASSOCIATION OF CANADA(ONTARIO)

Consumers' Association
of Canada (Ontario),
Room 400,
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January 16, 1981

Introduction

The Consumers' Association of Canada (CAC) is a voluntary, non-profit association with approximately 150,000 members located throughout Canada. The Association has branches in every Province and Territory. Membership in the Consumers' Association of Canada (Ontario) stands at about 56,000. The Association has the following objectives:

- A. to strengthen consumers through unity in order to improve the standard of living in Canadian homes;
- B. to study consumer problems and make recommendations for their solution;
- C. to bring the views of consumers to the attention of government, trade and industry, and to provide a channel between these and the consumer;
- D. to obtain and provide for consumers, information and counsel on consumer goods and services and to conduct research and tests for the better accomplishment of the objectives of the Association.

In pursuance of these objects, the Association, among other activities, make representations on behalf of the consumer interest before governmental bodies, including courts, legislatures and administrative tribunals.

We welcome this opportunity to express our views to the Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario. The Commission has a broad mandate; although the terms of reference appear to be simple, they are in fact so comprehensive as to offer the Commissioners a tremendous challenge, if the mandate is to be fulfilled, and answers found to the questions outlined in the Commission's explanatory brochure.

We are aware that the Royal Commission will be receiving much expert testimony. We feel this to be beyond our capability; we are not in a position to make technical recommendations, such as how best to measure asbestos contaminations, how best to clean it up, how much asbestos is too much. We urge the Commission members to solicit the broadest possible spectrum of views on these subjects, and we are confident that the Commission will study these expert opinions in a critical and objective manner so as to determine the wisest course.

We think it is suitable for the Consumers' Association of Canada (Ontario) to offer some general suggestions as to how consumers can be assisted to better understand and cope with the problems created by the widespread use of asbestos in our society.

Summary Recommendations:

1. Products which contain asbestos should be so labelled.
2. As technology permits, asbestos content of consumer and other products should be reduced or eliminated.
3. Consumers need more education in safe methods of handling and installation of asbestos, and other fibre-containing materials.
4. School courses, at public, secondary and college levels, such as "shop" and "automotive" courses, should include instruction in proper handling of asbestos-containing products.
5. Professional builders of private homes need similar education in handling of asbestos-containing material, both for their own protection, and to encourage proper clean-up after installation, for the protection of the home-buyer.
6. Both professional and amateur home renovators need education as to the potential risks in remodelling existing houses, including advice on the proper disposal of waste materials.
7. Such information should be included in the new programme of the Canadian General Standards Board and the Ontario Ministry of Housing regarding the certification of insulation installers.
8. Advertisers and illustrators should portray consumers and workmen as using proper clothing and handling methods when working with asbestos and other fibre-containing products.
9. Manufacturers of asbestos-containing products should be concerned with improving the bonding of asbestos fibres to the product to minimize fibre loss.
10. In schools and other public buildings, evaluation of levels of asbestos contamination should continue, especially in buildings frequented by children, with elimination of detected hazards by the most appropriate method.
11. Other community facilities, such as sports arenas, should also be investigated in this regard.
12. For air monitoring to be meaningful, there must be agreement on a uniform method of fibre counting, including agreement on how to deal with mats or clusters of fibres.
13. Continued research is needed into the potential effects of ingestion of asbestos fibres.
14. The media must show responsibility by accurate reporting of asbestos contamination instances, making sure that such reports include comparison to "normal" asbestos levels.
15. Research should continue to seek safe substitutes for asbestos in all situations.
16. Anti-smoking campaigns should be continued.

Explanation of Recommendations:

1. Labelling of asbestos-containing products: in line with CAC's general policy of calling for accurate labelling of consumer products, we urge that products containing asbestos be clearly identified, and marked with warnings as to proper handling methods. This is especially important in products where the asbestos occurs in an unconsolidated form, and where fibres may be released during the lifetime of the product. Use of such terms as "mineral" to describe product content is not sufficiently accurate. Due to the inclusion of asbestos in many consumer and commercial products, we cannot overstate the importance of this recommendation.
2. Elimination of asbestos: because of asbestos' many desirable characteristics, this will not be a simple matter, but should certainly be accepted as a goal.
3. Consumer education: through courses, brochures, the media, etc., we need
4. a viable programme of consumer education to demonstrate proper methods of handling all fibre-releasing materials; emphasizing the need to wear face masks and perhaps other protective clothing proper removal and handling of such protective clothing after work; sealing of fibre-containing materials, such as insulation with polyethylene or similar substances to reduce fibre leakage during the life of a building; proper clean-up of the work area afterwards; and proper disposal of any waste product. These concepts should be included in school courses at certain levels. Similarly, advanced automotive courses should demonstrate proper handling methods.
5. Education for professional home builders: much has been done in the field of occupational health to protect those who are extensively exposed to asbestos. However, it is desirable to encourage good work practices by those whose exposure may be more occasional. These people also need training in the best ways to handle asbestos and other fibre-containing materials. Careful cleanup after each stage of construction is important, and sealing of areas where possible. Proper disposal of scrap materials is also necessary.
6. Renovations: professionals and consumers may run considerable risks of asbestos exposure during home renovation, possibly exceeding those involved in new construction; because of the levels of dust of all kinds generated in removing old construction materials, and also because asbestos was formerly used in drywall joint cements and spackling and patching compounds, so that disturbing these materials can cause exposure. Education is needed, again, as to proper work methods and clean-up and disposal of waste materials.
7. The Ontario Ministry of Housing and the Canadian General Standards Board are involved in a programme for training and certifying insulation installers; health-related precautions should be included in this programme.

8. Responsibility of advertisers and illustrators: it is essential that pictures of people handling materials such as insulation and ceiling tiles, which may contain asbestos, or other fibres, show the use of face masks and other protective equipment if needed.
9. Minimizing fibre loss from products: since it is the release of asbestos fibres into the air, or into liquids to be ingested, which creates the health hazard, it would seem wise to improve the bonding of fibres to exposed surfaces. For example, careful painting of the reverse side of ceiling tiles could reduce the amount of dust released during installation, and would also presumably reduce potential fibre loss. This could be especially important in a suspended ceiling, where panels are occasionally removed to provide access to wiring, and where air may move across the back surface of the tiles.
10. Schools and public buildings: the problem of airborne asbestos in schools and public buildings will be receiving much attention in other submissions, which will contain expert opinions and specific examples; CAC has not endeavoured to duplicate these efforts. We are concerned that contamination be eliminated as completely as possible. While removal of sprayed asbestos materials would seem to be the ideal solution, it is costly; and, if not done carefully, with adequate clean-up, can leave some level of contamination in the building. Therefore, each case should be considered separately; in areas where schools are being closed due to declining enrollment, and can be remodelled for other uses, encapsulation might be adequate, with the more costly remedy of removal being used in schools in continuing use. It is certainly vital to pay special attention to those areas in public building where asbestos-coated surfaces are subjected to jarring, vibration, impact and abrasion; such as gyms, shops, hallways and locker rooms.
11. Other community facilities: there should perhaps be some investigation of other public facilities frequented by children, such as ice sports arenas. Some of these structures have ceiling insulation consisting of batts held in place by wire mesh, sealed with a plastic film, which is not impervious to assaults by high-flying hockey pucks, as demonstrated by occasional punctures. Possibly, the insulation material does not contain asbestos, and probably not too many fibres are released. Nevertheless, some community residents, of varying ages, spend many hours in these buildings.
2. Monitoring air-borne asbestos: if any meaningful information is to be gathered about asbestos levels in buildings of all types, there must be agreement on such technical matters as: how and where to locate sampling devices, how to count fibres, which fibres to count, and the significance of overall size, length and length-width ratio of fibres. It is essential to work out a method for counting or evaluating mats or clusters of fibres.

13. Ingestion of fibres: in our concern with the inhalation of asbestos fibres, we must not overlook the need for research into the effects of eating and drinking asbestos-contaminated substances. The importance of study in this area is illustrated by a recent study of asbestos in drinking water and cancer incidence in the San Francisco Bay area. It appears that we need to establish a standard for asbestos content in drinking water.
14. Responsibility of the media: responsibilities of governments, manufacturers, home builders, and consumers have been mentioned; it is also important to identify the responsibility of the media in reporting findings regarding asbestos. The general public is not aware of the significance of specific fibre counts, taken out of context; media reports must try to present the whole picture. For example, a report of asbestos fibre levels in popular beverages is not meaningful unless the report also mentions levels of asbestos in other substances, such as specific municipalities' drinking water, or the Great Lakes as a whole. This is not to suggest that the media should cover up a dangerous situation; merely that they should not seek to generate hysteria.
15. The search for safe substitutes: this must continue, since reducing the use of asbestos will reduce the risks of exposure. However, it would be a mistake to choose alternate materials which turn out in time to present the same or greater hazards as does asbestos. Therefore, research must continue towards discovering why exposure to asbestos increases the risk of developing cancer and respiratory disease; and then to ensure that substitutes differ from asbestos in regard to this key cancer-causing factor.

~~We must also accept the possibility that it will not be possible to find a safe substitute for asbestos.~~ Perhaps there is no material which offers the useful qualities which makes asbestos so necessary, and which does not also pose a threat to health, much as does asbestos.

With this in mind, CAC would recommend that research be continued into more effective methods of sealing or encapsulating asbestos now in place and maintaining its effectiveness as insulator, fire protector, etc.

16. Anti-smoking campaigns: the literature certainly suggests that smokers who are exposed to asbestos are at much higher risk than non-smokers. Thus it would seem reasonable to regard anti-smoking campaigns as a useful tool in reducing incidence of asbestos-related diseases, as well as reducing health problems in society as a whole.

Conclusion:

The Consumers' Association of Canada (Ontario) recognizes the serious and complex nature of the problems associated with the use of asbestos in Ontario. Asbestos is a mineral of great value to society but one which has exacted a

great price in terms of human suffering. It is this fact of asbestos' ubiquity, coupled with its threat to health, that makes it such an important consumer issue. We feel that the Royal Commission has therefore a grave responsibility; we hope that the Commission's study will result in the development of workable and intelligent programmes to minimize asbestos-related dangers to health. We appreciate having this opportunity to mention some consumer concerns about this very consequential subject.

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